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PROCEEDINGS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS

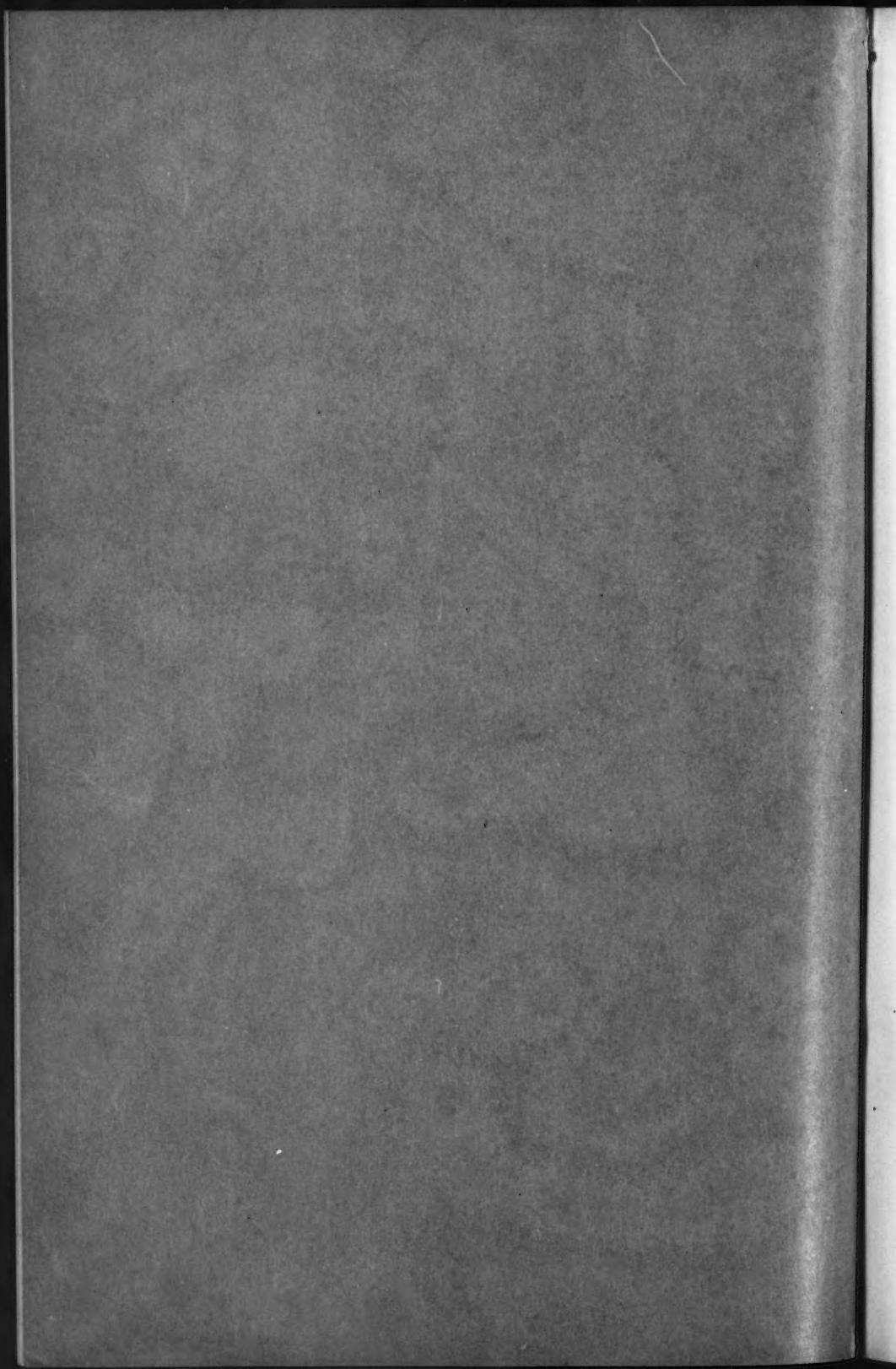
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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852.

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed
in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS

OF THE SOCIETY

SIXTY-SIXTH ANNUAL MEETING*

January 15th, 1919.—The meeting was called to order at 10 A. M., in the Auditorium of the Engineering Societies Building; President Arthur N. Talbot in the chair; Chas. Warren Hunt, Secretary; and present, also, about 650 members.

Vice-Presidents George S. Webster and George W. Kittredge were invited to take seats on the platform.

The President announced that he had appointed Messrs. P. P. Farley, J. W. F. Bennett, A. S. Crane, James Forgie, L. V. Morris, J. W. Nelson, C. U. Powell, E. J. Rosencrans, and B. H. Wait as Tellers to Canvass the Ballot for Officers for the ensuing year.

* A full report of the Sixty-sixth Annual Meeting is printed on pages 131 to 150 of this number of *Proceedings*.

The President delivered the Annual Address.*

The Annual Report of the Board of Direction, and the Annual Reports of the Secretary and of the Treasurer,† for the year ending December 31st, 1918, were presented and accepted.

The Secretary read the report of the Committee to Recommend the Award of Prizes,‡ and announced that the medals and prizes for the year ending July, 1918, had been awarded by the Board of Direction in conformity with that report, as follows:

THE NORMAN MEDAL to Paper No. 1396, "Multiple-Arch Dams on Rush Creek, California", by L. R. Jorgensen, M. Am. Soc. C. E.

THE J. JAMES R. CROES MEDAL to Paper No. 1388, "Tunnel Work on Sections 8, 9, 10, and 11, Broadway-Lexington Avenue Subway, New York City", by Israel V. Werbin,§ Assoc. M. Am. Soc. C. E.

THE THOMAS FITCH ROWLAND PRIZE to Paper No. 1397, "The Reconstruction of the Stony River Dam", by F. W. Scheidenhelm, M. Am. Soc. C. E.

THE JAMES LAURIE PRIZE to Paper No. 1391, "Unusual Cofferdam for 1 000-Foot Pier, New York City", by Charles W. Staniford, M. Am. Soc. C. E.

THE COLLINGWOOD PRIZE FOR JUNIORS to Paper No. 1379, "Designing an Earth Dam Having a Gravel Foundation, With the Results Obtained in Tests on a Model", by James B. Hays, Jun. Am. Soc. C. E.

The Secretary presented the report of the Tellers appointed by the Board of Direction to canvass the final suggestions for members of the Nominating Committee, to represent certain districts, and the following were appointed to serve for two years:

	Representing District	No. 1
J. J. Yates.....	"	3
F. P. Williams.....	"	5
J. S. Conway.....	"	6
N. S. Sprague.....	"	10
F. E. Weymouth.....	"	11
W. K. Barnard.....	"	13
H. L. Haehl.....	"	

Desmond FitzGerald, Past-President, Am. Soc. C. E., Chairman of the Special Committee on Engineering Education, presented the report of Dr. Mann, of the Carnegie Foundation for the Advancement of Teaching, as the final report of that Committee. Mr. FitzGerald also offered a resolution to the effect that the President be authorized to

* See page 29 of Papers and Discussions.

† For these reports see pages 27 to 42 of *Proceedings* for January, 1919 (Vol. XLV).

‡ See page 132.

§ Mr. Werbin resigned his membership in the Society on December 31st, 1917.

appoint a committee of three to confer with committees of the other Societies in order to secure a complete discussion of Dr. Mann's report.

On motion, duly seconded, the resolution was referred to the Board of Direction, and the Special Committee on Engineering Education was discharged with thanks.

Robert A. Cummings, M. Am. Soc. C. E., Chairman of the Special Committee to Codify Present Practice on the Bearing Value of Soils for Foundations, reported progress.

The Secretary presented, for the Special Committee to Report on Stresses in Railroad Track, a brief progress report.*

The Secretary presented a letter from F. H. Newell, M. Am. Soc. C. E., Chairman of the Special Committee on the Regulation of Water Rights, requesting that the Committee be continued for another year.

On motion, duly seconded, the Special Committee on the Regulation of Water Rights was continued.

The Secretary stated that he had been requested by Onward Bates, Past-President, Am. Soc. C. E., Chairman of the Committee on the Alfred Noble Memorial, to report briefly that, although the project had been held up on account of the war, it was as much alive as ever in the minds of the Committee, and that it is the intention to complete the Memorial as soon as the way is open for making progress.

The Secretary presented the Preliminary Report of the Committee on Development.†

The report was accepted and the Committee continued.

The Secretary reported that the following resolution had been adopted by the Board of Direction at its meeting on January 14th, 1919:

"The Board of Direction of the American Society of Civil Engineers, having considered the resolutions passed by the Brooklyn Engineers' Club in regard to the summary dismissal of about 350 engineering employees of the Public Service Commission, District No. 1, State of New York,

"Resolved, That, on the statement of facts thus presented, the dismissal of these employees, many of them specifically qualified for the difficult undertaking in which they were engaged, was not only eminently unjust and an offence to the Engineering Profession, but was directly opposed to the best interests of the City of New York, and therefore opposed to the best interests of the country;

"Resolved, That this Board, recognizing this to be a matter upon which the Engineering Council has properly taken prompt action, and understanding that a hearing of those directly concerned has been called for this afternoon, the record of this action be filed at once with the Secretary of the Engineering Council."

On motion, duly seconded, the action of the Board of Direction was approved by the meeting.

* See page 139.

† Printed in *Proceedings* for December, 1918, p. 1117.

The Secretary announced the election of the following candidates on January 13th, 1919:

AS MEMBERS

CHARLES IRVING ANDERSON, Chicago, Ill.

EDWARD STEWART ANDERSON, Pocatello, Idaho

THEODORE ALEXANDER BEYER, Salt Lake City, Utah

GEORGE HOLLOWAY CAIRNS, Gainesville, Fla.

ANDREW ARNOLD COHILL, New York City

RALPH HAWES GAGE, Chicago, Ill.

JAMES OSBERNE HACKENBERG, Wilmington, Del.

SAMUEL PRESCOTT HALL, Columbus, Ohio

ARTHUR ALBERT JOHNSON, Washington, D. C.

BARZILLAI ALLEN RICH, Hingham, Mass.

HERBERT LAFAYETTE RUSSELL, Detroit, Mich.

ACHESON SMITH, Niagara Falls, N. Y.

AS ASSOCIATE MEMBERS

LAMAR ACKER, Nacogdoches, Tex.

ANDREW ELLIOTT ANDERSON, Brownsville, Tex.

LEROY ARNOLD, Kansas City, Kans.

WENDELL PHILIP BALL, Cincinnati, Ohio

WILLIAM EARNEST BEILHARZ, Dallas, Tex.

THOMAS JOSEPH BOYLE, Fortyfort, Pa.

FRANKLIN HENRY CHAPIN, Anchorage, Alaska

WILLIAM HENRY COLLISON, JR., Ocean City, N. J.

OLIVER RAYMOND DINSMORE, Minneapolis, Minn.

NATHAN WASHINGTON DOUGHERTY, Knoxville, Tenn.

EVERETT WESLEY DUNN, Sioux City, Iowa

ERNEST EVERE, Arroyo Grande, Cal.

ARTHUR E. FARRINGTON, Camp Lee, Va.

ARTHUR JENKINS FORD, Los Angeles, Cal.

ROBERT MYRON FOX, Warren, Ariz.

RALPH WELLES GAYLORD, Honolulu, Hawaii

MORRIS GOODKIND, Lynbrook, N. Y.

FRED JUSTUS GRUMM, San Diego, Cal.

GERARDUS HARRISSON, Lima, Ohio

NORMAN HADEN HILL, Washington, D. C.

LAURENCE HUSSEY, Boston, Mass.

HAROLD DEAN JOLLEY, Omaha, Nebr.

JOHN FREDERICK JUNG, New York City

EDWARD LEO LARKIN, New York City

PETER FRANCIS LA VALLE, Valier, Mont.

JAMES BLAIR LONG, Norristown, Pa.

RICHARD LIPKEY LONGSHORE, Montpelier, Ohio

JOHN WESLEY LOWELL, Jr., Pittsburgh, Pa.
 JOHN LUCEY, Santiago, Dominican Republic
 CLARK ORROMELL MARKHART, Pittsburgh, Pa.
 EARLE MAULDIN, Winston-Salem, N. C.
 ALLAN DAVID MILLARD, Beardstown, Ill.
 WALTER MOORE, Jr., Los Angeles, Cal.
 THOMAS CLINTON MULLINS, Boonville, Ind.
 JOSEPH AUGUSTINE MURRAY, Jr., Philadelphia, Pa.
 EDWARD DOUGLAS NICKERSON, Sacramento, Cal.
 JOHN MARSHALL PAGE, Aberdeen, Md.
 HARRY JOHN PHILLIPS, New York City
 WILLIAM STANTON ROOT, Am. Exp. Forces, France
 CLARENCE STANLEY SALE, New York City
 OLE SINGSTAD, Brooklyn, N. Y.
 HYRAND ARAKEL SIVASLIAN, Akron, Ohio
 ERWIN WEIR SMITH, Houston, Tex.
 THOMAS ELWOOD STANTON, Jr., Sacramento, Cal.
 BENJAMIN ELLIS WARREN STOUT, Kansas City, Mo.
 DANIEL VOIERS TERRELL, Lexington, Ky.
 CLARENCE HENRY TRASK, Penniman, Va.
 WILLIAM HENRY TRINKAUS, Chicago, Ill.
 SAMUEL NEWBOLD VAN TRUMP, Wilmington, Del.
 MARTIN WALLACE WATSON, Topeka, Kans.
 FOSTER PRATT WENTZ, Portland, Ore.
 ROLAND HOWARD WILLCOMB, Lowerotay, Cal.
 GUY MORRIS WILLIAMS, Washington, D. C.

AS JUNIORS

MUNSON JULIUS DOWD, Long Beach, Cal.
 MAURICE DAVID GLESSNER, Camp A. A. Humphreys, Va.
 VICENTE MILLS, Manila, Philippine Islands
 JAMES ALAN NOXON, Columbia, S. C.
 FERNANDO CHARLES PIODA, Seattle, Wash.
 JOHN PERRY SHUMAKER, Xenia, Ohio

The Secretary announced the transfer of the following candidates on January 13th, and 14th, 1919:

FROM ASSOCIATE MEMBER TO MEMBER

FREDERICK WILHELM ALBERT, Burlington, Vt.
 JOHN AYER, Medford, Mass.
 LUCIUS TULLIUS BERTHE, Charleston, Mo.
 BENJAMIN ALEXANDER HODGDON, East Orange, N. J.
 ALFRED RAYMOND LINDSEY, Philadelphia, Pa.
 ALEXANDER SYDNEY LYNCH, West Haven, Conn.

DANA QUICK McCOMB, Corregidor, Philippine Islands

CHARLES LOUIS MEYER, Omaha, Nebr.

ALEXANDER NORMAN MILLER, Denver, Colo.

GEORGE EMIL JOHN PISTOR, New York City

NATHAN THOMAS VEATCH, Jr., Kansas City, Mo.

JOHN LEONARD VOGEL, Jersey City, N. J.

WILLIAM WILSON, Tokyo, Japan

FRANK COY WOODWARD, Camp A. A. Humphreys, Va.

NORMAN COOPER WOODY, St. Louis, Mo.

FROM ASSOCIATE TO ASSOCIATE MEMBER

ALEXANDER ALLEN MACVICAR RUSSELL, Berkeley, Cal.

FROM JUNIOR TO ASSOCIATE MEMBER

RAY WILLIAM BERDEAU, Camp Sevier, S. C.

WALTER AUGUSTUS BUELL, Cuyahoga Falls, Ohio

EDWARD LOUIS HABERLE, Minneapolis, Minn.

EDWARD CRITTENDEN HARDING, JR., Dayton, Ohio

FRANK HELM, Topeka, Kans.

FRANK MILES KUCHAR, Muscle Shoals, Ala.

KARL ANDREW MILLER, Am. Exp. Forces, France

MARTIN J. ORBECK, Am. Exp. Forces, France

JAMES REX PEMBERTON, Flint, Mich.

EMILE LEONARD RIMBAULT, New York City

MAX STEINBERG, Washington, D. C.

ANDREW JACKSON VAN SISE, Audubon, Iowa

ROBERT YULE WALKER, Oklahoma, Okla.

ALPHONSE MUELLER WESTENHOFF, Cincinnati, Ohio

SYDNEY WILMOT, New York City

The Secretary announced the following deaths:

WILLIAM APPLETON HAVEN, of Buffalo, N. Y., elected Member, March 5th, 1873; died January 6th, 1919.

GEORGE ALEXANDER JUST, of Long Island City, N. Y., elected Junior, September 3d, 1884; Member, March 4th, 1891; died December 27th, 1918.

HENRY PRENTICE MORRISON, of West New Brighton, N. Y., elected Member, April 6th, 1898; died December 17th, 1918.

ROBERT EDWARD DAKIN, of Stevenson, Conn., elected Junior, December 2d, 1914; Associate Member, January 15th, 1917; died December 15th, 1918.

CLARENCE FREDERICK EBERLY, of Perrysburg, Ohio, elected Associate Member, September 6th, 1910; died December 19th, 1918.

CHARLES HENRY HOWARD GILLEAN, of Natchez, Miss., elected Associate Member, October 8th, 1918; died November 8th, 1918.

JOHN WILLIAM HORTON, of Sacramento, Cal., elected Junior, September 1st, 1908; Associate Member, December 2d, 1914; died December 24th, 1918.

GRANDVILLE REYNARD JONES, Capt., San. C., U. S. A., of Baltimore, Md., elected Junior, January 7th, 1908; Associate Member, May 2d, 1911; died in service (Camp Benning, Ga.), December 22d, 1918.

AUSTIN RUSSELL WILLARD SPERRY, of Anderson, Cal., elected Junior, December 6th, 1910; Associate Member, January 15th, 1917; died December 6th, 1918.

The Secretary presented invitations to the membership from T. Kennard Thomson and Francis L. Pruyn, Members, Am. Soc. C. E., to visit and inspect the foundations of the New Assay Building on Wall Street; and from Mr. D. H. Cox and R. J. Wig, Assoc. M. Am. Soc. C. E., to visit the yard of the Fougner Shipbuilding Company and inspect a concrete ship under construction.

The following resolutions were offered by R. S. Buck, M. Am. Soc. C. E.:

"Whereas, It is vital to the peace and welfare of our country that, during the necessary reconstruction period following the war, the number of unemployed be reduced as much as possible; and

"Whereas, The development of transportation, sanitation, power, and public utilities generally is necessary to the development and prosperity of the country; and

"Whereas, The curtailment of needed public works during the period of the war has retarded the development of the country; and

"Whereas, The speediest and most effective means to prevent the suffering, distress, and demoralization resulting from unemployment is afforded by public works; and

"Whereas, The public welfare and confidence, upon which industry generally depends, require that the construction of public works be vigorously prosecuted; therefore, be it

"Resolved, That the American Society of Civil Engineers, assembled in their Sixty-sixth Annual Meeting, this fifteenth day of January, 1919, desires to record its profound conviction that public works should be carried forward to the fullest extent consistent with sound judgment, not only for fundamental economic reasons, but for humanitarian reasons, to furnish employment for all who can properly claim employment, especially returning soldiers; and be it further

"Resolved, That copies of this resolution be forwarded to such Federal, State and municipal authorities as may be able, in the opinion of the Executive Committee of the Board of Direction of the Society, to promote the purposes of these resolutions."

The resolutions were adopted unanimously.

M. O. Leighton, M. Am. Soc. C. E., Chairman of the National Service Committee, discussed the work of that committee, and asked the membership for suggestions as to the scope of its work.

Charles Hansel, M. Am. Soc. C. E., offered a resolution to the effect that the members of the four Founder Societies be asked for a subscription of \$5 each to form a fund to be placed at the disposal of Engineering Council.

On motion, duly seconded, the resolution was laid on the table.

The Secretary presented the report of the Tellers appointed to canvass the Ballot for Officers for the ensuing year.

The President announced the election of the following officers:

President, to serve one year:

FAYETTE S. CURTIS, Boston, Mass.

Vice-Presidents, to serve two years:

HERBERT S. CROCKER, Denver, Colo.

LEONARD METCALF, Boston, Mass.

Treasurer, to serve one year:

ARTHUR S. TUTTLE, New York City

Directors, to serve three years:

GEORGE H. CLARK, New York City

JACOB S. LANGTHORN, New York City

CHARLES C. ELWELL, New Haven, Conn.

WILLARD BEAHAN, Cleveland, Ohio

JOHN W. ALVORD, Chicago, Ill.

C. E. GRUNSKY, San Francisco, Cal.

F. P. Stearns and Clemens Herschel, Past-Presidents, Am. Soc. C. E., conducted Mr. Curtis to the chair. Mr. Curtis addressed the meeting briefly.

Adjourned.

February 5th, 1919.—The meeting was called to order at 8.30 p. m.; President Fayette S. Curtis in the chair; Chas. Warren Hunt, Secretary; and present, also, 195 members and guests.

The minutes of the meeting of December 18th, 1918, were approved as printed in *Proceedings for January, 1919.*

Francis Lee Stuart, M. Am. Soc. C. E., late Chairman, Budget Committee, Eastern Railroads, addressed the meeting on the subject, "The National Railroad Situation of To-Day and a Suggested Basis for Legislation". The subject was discussed by Messrs. T. Kennard Thomson, A. J. County, G. W. Kittredge, Calvin Tomkins, Augustus Smith, J. H. Bernhard, George J. Ray, H. C. Keith, and Francis Lee Stuart.

The Secretary announced the following deaths:

FREDERICK BROOKS, of Boston, Mass., elected Junior, June 7th, 1876; Member, January 2d, 1884; died January 10th, 1919.

ROLLA CLINTON CARPENTER, of Ithaca, N. Y., elected Member, April 4th, 1911; died January 19th, 1919.

MARVIN WATSON KINGSLEY, of Ripley, N. Y., elected Member, July 3d, 1878; date of death unknown.

FRED CASWELL STANTON, of Jacksonville, Fla., elected Associate Member, April 1st, 1908; Member, December 31st, 1913; died January 24th, 1919.

HENRY MORTON STONE, of St. Joseph, Mo., elected Member, April 3d, 1907; died December 8th, 1918.

BERNT BERGER, of New York City, elected Associate Member, April 5th, 1893; died January 15th, 1919.

GUSTAVO ADOLFO DUBOIS, of Havana, Cuba, elected Junior, September 1st, 1908; Associate Member, May 6th, 1914; died August 30th, 1918.

WILLIAM WETMORE GIBBS, of Gainesville, Fla., elected Junior, October 7th, 1914; Associate Member, May 15th, 1917; died January 13th, 1919.

VICTOR HUGO BELL, of Coronado, Cal., elected Junior, March 14th, 1916; died in service, January 6th, 1919.

RALPH RICHARDSON MARRIAN, 2d Lieut., Engrs., U. S. A., of Greenville, S. C., elected Junior, April 18th, 1916; killed in action (France), October 17th, 1918.

CHARLES GILBERT REILLY, Capt., Engrs., U. S. A., of Pittsburgh, Pa., elected Junior, May 7th, 1913; killed in action (France), October 1st, 1918.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

January 13th, 1919.—The Board met at 10.15 A. M.; President Talbot in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Alvord, Coleman, Darling, Fay, Flinn, Fort, Hawgood, Ketchum, Khuen, Kittredge, Marx, Noble, Pegram, Rights, Wagner, Wall, and Webster.

Mr. Kittredge, Chairman of the Finance Committee, presented a statement of the present condition of the finances of the Society, together with a proposed Budget for 1919, which Budget was recommended to the incoming Board for adoption.

Mr. Flinn, Chairman of the Library Committee, reported the following resolutions adopted January 9th, 1919, by the Library Board of the United Engineering Society:

"Resolved: That the Library Board hereby recommends to the Board of Trustees that the Engineering Societies Library be recata-

logged as one library as soon as possible, under the direction of the Director, it being understood that the cost will be from \$20 000 to \$25 000.

"Resolved: That the four Founder Societies be requested to make additional appropriations of \$2 500 per year per society to meet the above expenses."

The Board adopted the following resolution:

"Resolved: That the American Society of Civil Engineers approves the project for recataloguing the Engineering Societies Library and expresses its willingness to assist financially; nevertheless, this Society recommends that the cost of recataloguing be defrayed from funds of the United Engineering Society."

Mr. Rights, Chairman of the Publication Committee, reported a recommendation that, in order to reduce the cost of the Year Book for 1919, the alphabetical list and the list of deceased members be omitted.

On motion, duly seconded, it was decided to retain all the lists in the Year Book for 1919.

The Report of the Board of Direction prepared by the Executive Committee was presented, amended, and adopted for presentation to the Annual Meeting.*

The minutes of the meetings of the Executive Committee of November 1st and November 22d, 1918, and the actions taken at these meetings concerning the financial condition of the Society; Invitation from the French Society of Engineers to send a Delegation to attend a Conference in Paris on Reconstruction;† Exemption from Dues on Account of Military Service; Report of Committee on Reconstruction; Establishment of National Service Committee in Washington;‡ etc.. were approved.

The Secretary reported that several verbal reports of progress, but no final report, had been received from the Committee on Setting and Judging Engineering Problems. The whole matter was referred to the Committee on Special Committees.

A committee consisting of Messrs. J. L. Van Ornum, Chairman, Mortimer E. Cooley, William Cain, Chas. D. Marx, and Geo. F. Swain, has been considering the question of Student Branches for some time, and a report, dated November 14th, 1918, signed by every member of the Committee except Mr. Cooley was presented; a report signed by Mr. Cooley, dated January 9th, 1919, was also presented.

On motion, duly seconded, it was voted that this Board favors the establishment of Student Branches, and refers the whole matter to the Committee on Development.

* *Proceedings*, Am. Soc. C. E., January, 1919, pp. 27-38.

† *Proceedings*, Am. Soc. C. E., December, 1918, p. 1107.

‡ *Proceedings*, Am. Soc. C. E., December, 1918, p. 1106.

Mr. Alvord, Chairman of the Committee on Special Committees, reported progress.

Messrs. Arthur N. Talbot and Joseph R. Worcester were appointed to represent this Society on Engineering Council, to succeed Messrs. F. H. Newell and George F. Swain.

The following resolutions prepared by Cadwalader, Wickersham and Taft, attorneys for The Bowery Savings Bank, forwarded through Parker and Aaron, counsel for the Society, were presented and unanimously adopted:

"Resolved: That the time for the payment of a certain bond and mortgage for the sum of Two hundred thousand dollars (\$200 000), which is about to be assigned to The Bowery Savings Bank, covering premises known by the street numbers 218 and 222 West 57th Street, in the Borough of Manhattan and City of New York, the said mortgage being recorded in the office of the Register of the County of New York, on December 15, 1916 in section 4, Liber 267 of Mortgages, page 329, which said mortgage now bears interest at the rate of five per centum per annum, be extended for the term of five years, with interest thereon at the increased rate of six per centum per annum, payable half-yearly on the first days of February and August during said extended term, with the privilege, after the expiration of one year, of making payments on account of said principal sum of Two hundred thousand dollars (\$200 000) in multiples of Ten thousand dollars (\$10 000) at any time, and that an agreement to that effect be entered into between this corporation and the said Bank under the corporate seal of this corporation, and that the President or a Vice-President, and the Secretary of this corporation be and they hereby are authorized and directed to affix the corporate seal of this corporation to said agreement and to execute, acknowledge, and deliver said agreement containing such covenants, provisions and clauses as may be required by the said Bank or its counsel to be inserted therein."

The Secretary reported that the old Society House had been changed into a fine commercial building, and that the Ajax Rubber Company had been in possession since December 15th, 1918.

The Secretary reported the appointment, by the Executive Committee, of delegates to the Joint Engineering Congress in Paris.

The Secretary presented the resolutions adopted by the Duluth Association of Members, endorsing the action of the Executive Committee in sending a delegation of engineers to France, but protesting that the delegation, composed of five engineers from New York City and one from Boston, is not geographically representative of the Society. The Secretary was instructed to draft a letter* stating in detail the reasons for the action taken, and to forward a copy to each of the Local Associations.

The Secretary presented the resolutions adopted by the Duluth Association urging that the Board should specially authorize a meeting

* See page 198.

of the Development Committee at the time of the Annual Meeting; also by the San Francisco Association; also Minutes of Meetings of the Texas, St. Louis, Pittsburgh, Nebraska, and Seattle Associations showing their views regarding the Committee on Development. The Secretary was instructed to reply,* expressing the views of the Board of Direction, and sending a copy of Secretary Howson's letter to those Associations.

The Secretary presented a letter from Mr. J. A. Ockerson, stating his opinion that Mr. John W. Alvord is not eligible for election at this time as a Director of the Society, under the provisions of Art. V, Sec. 4, of the Constitution. Action had already been taken by the Board at a previous meeting, but, after thorough discussion, the following resolution was placed on record:

"Resolved: That the Board of Direction rules that the appointment of a member of the Board to fill the unexpired term of a member of the Board of Direction, does not constitute an election of said member, and, therefore, does not make such member ineligible to election."

The Secretary presented a communication from the Secretary of Engineering Council transmitting a vote asking that the unexpended balance of the appropriation made to Engineering Council for 1918 be re-appropriated for the uses of Engineering Council, it being intended to apply it to the work of the National Service Committee in Washington. The request, so far as this Society is concerned, was granted.

The Secretary presented several letters in reference to the American Engineering Standards Committee, among them one from J. Martin Schreiber, of that Committee, stating four important actions taken by the Committee, briefly, as follows:

1. Approval of budget for year 1919, which carries with it the appropriation of \$1 200 from each Founder Society.
2. Appropriation to cover expenses for the remainder of the year 1918.
3. Complete lists with addresses of members of committees of Founder Societies engaged in standardization work.
4. Order of appointment of Founder Society representatives and tenure of office.

The Secretary presented a history of the matter, in so far as it relates to the representation of this Society on the Committee.

The resignation of Mr. John H. Gregory as a member of the Committee was presented and accepted.

The Secretary was instructed to say to the Chairman of the Committee that the \$500 which the Board had appropriated was to cover

* See page 200.

its share of the expense for one year from the date of the appropriation (October 8th, 1918), and that any further appropriation for 1919, if made, must be acted on by the incoming Board of Direction.

A committee was appointed to consider and report later to the Board on the matter of representatives of this Society on the American Engineering Standards Committee. This Committee subsequently reported the nomination of Mr. Henry Jackson Burt, and recommended that the term of Mr. Schreiber be for one year, of Mr. Latey for two years, and of Mr. Burt for three years. The recommendation of the Committee was adopted.

A report was received from the Committee to Recommend the Award of Prizes. It was voted that the recommendations of the Committee be approved and that the medals and prizes be awarded by the Board in accordance therewith.*

The Secretary reported that Mr. J. V. Davies had accepted his re-election as one of the representatives of this Society in the United Engineering Society for a term of three years.

The Secretary presented a letter from Mr. Fraser S. Keith, Secretary of the Engineering Institute of Canada, addressed to the Council of the American Society of Civil Engineers, extending cordial greeting of felicitation and good will. The Secretary was instructed to reply.

The Secretary reported that, on invitation from the Society for the Promotion of Engineering Education, President Talbot had appointed George F. Swain, Past-President, Am. Soc. C. E., to represent the Society at a special meeting, held December 6th and 7th, 1918, in connection with the British Educational Mission at the Massachusetts Institute of Technology.

Charles D. Marx, Past-President, Am. Soc. C. E., was appointed as a representative of this Society on the Washington Commission of Award to succeed Mr. William H. Finley.

The Secretary presented an invitation to the Society, from the American Institute of Mining Engineers, to be represented at their next meeting in New York City, February 17th-20th, 1919. The matter was referred to the President with power, and he subsequently appointed Messrs. G. Aertsen, Albert Ladd Colby, and T. R. Lawson.

The Secretary reported that, on December 2d, 1918, at a conference of representatives of the four National Societies, and of the Society for the Promotion of Engineering Education, and the Society of Automotive Engineers, it was agreed that the Committee should be enlarged by the addition of delegates appointed by other national societies interested. Dr. Hunt was appointed to represent this Society, but, as he had been appointed to represent the Society for the Promotion of Engineering Education, he presented his resignation as a representative of this Society in order that some one else might be appointed. The Presi-

* See p. 132.

dent was authorized to appoint a member of this Society to represent it on a Committee on Technical Symbols. The Secretary also reported that at this conference it was suggested that each of the four Founder Societies be asked to appropriate \$50 for the work of this Committee. The request was granted so far as this Society is concerned.

A report of the Committee to Canvass the Final Suggestions in the matter of the Nominating Committee, Messrs. Fort, Noble, and Flinn, was received and ordered presented to the Annual Meeting.*

The Secretary reported that in reply to the circular issued on November 20th, 1918, offering copies of reprints of the papers of the International Engineering Congress, 1904, free of charge, 1104 requests for papers had been received, and up to the present time 717 of these had been filled, and that about 8600 papers had been forwarded; that 387 requests still remain to be filled, and that probably the stock would not last.

Action was taken in regard to members in arrears for dues.

The resignations of 7 Members, 14 Associate Members, 2 Associates, and 2 Juniors, were accepted.

Ballots for membership were canvassed, resulting in the election of 12 Members, 53 Associate Members, 6 Juniors, and the transfer of 15 Associate Members to the grade of Member, 1 Associate to the grade of Associate Member, and 15 Juniors to the grade of Associate Member.

Applications were considered and other routine business transacted.

Adjourned.

January 14th, 1919.—The Board re-convened at 9.45 A. M.; President Talbot in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Alvord, Coleman, Darling, Davis, Fay, Flinn, Hawgood, Humphreys, Ketchum, Khuen, Kittredge, Marx, Pegram, Rights, Wagner, Wall, and Webster.

The Secretary presented a communication from the Brooklyn Engineers Club relating to the summary dismissal of more than 300 engineers by the Public Service Commission of this District and the following resolution was adopted:

"Resolved: That on the statement of facts thus presented, that the dismissal of these employees, many of them specifically qualified for the difficult undertaking in which they were engaged, was not only eminently unjust and an offence to the Engineering Profession, but was directly opposed to the best interests of the City of New York, and therefore opposed to the best interests of the country.

"Resolved: That this Board, recognizing this to be a matter upon which Engineering Council has properly taken prompt action, and understanding that a hearing of those directly concerned has been called for this afternoon, the record of this action be filed at once with the Secretary of Engineering Council."

* See p. 133.

The Secretary was instructed to report this action to the Annual Meeting.

A report from the Membership Committee was received and acted upon.

Adjourned.

January 15th, 1919.—The Board met at 1.35 P. M., at the Headquarters of the Society, 33 West 39th Street, New York City, at the time of the Annual Meeting, as required by the Constitution (Art. VI, Sec. 7); President Curtis in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Alvord, Beahan, Clark, Coleman, Crocker, Darling, Davis, Elwell, Flinn, Fort, Grunsky, Hawgood, Herschel, Ketchum, Langthorn, Marx, Metcalf, Pegram, Rights, Talbot, Tuttle, Wagner, and Wall.

The President announced that the next business was the election of a Secretary.

Mr. Hunt retired.

Chas. Warren Hunt was nominated and elected Secretary.

Mr. Hunt was recalled and informed of his election.

A Budget for the year 1919 prepared by the Board of Direction last year, and which was recommended to the incoming Board for adoption, was presented and adopted.

The following Standing Committees of the Board were appointed:

On Finance:

Nelson P. Lewis, *Chairman*
H. S. Crocker
George H. Clark
John F. Coleman
Milo S. Ketchum

On Library:

Alfred D. Flinn, *Chairman*
John A. O'Connor
Arthur P. Davis
Willard Beahan
Chas. Warren Hunt

On Publications:

Lewis D. Rights, *Chairman*
Andrew M. Hunt
Charles C. Elwell
Samuel T. Wagner
J. S. Langthorn

On Special Committees:

John W. Alvord, *Chairman*
Arthur S. Tuttle
Leonard Metcalf

It was voted that the next Convention be held in the "Twin Cities" of St. Paul and Minneapolis, Minn., and the President was authorized to appoint a Committee of three of the Board with power to arrange for the Convention, and he subsequently appointed Messrs. Darling, Wall, and C. W. Hunt.

The request of the New York Meetings Committee that, now that the War is over, refreshments be served at Society Meetings was granted, and appropriation for that purpose made.

The Secretary made a statement with regard to the work of the office, and suggested a method by which he could be relieved of some of the detail work, which has increased largely.

After a thorough discussion of the matter it was voted:

"Resolved: That the President be authorized to appoint a Committee of five, of which he shall be one, to consider the question of retiring the present Assistant Secretary and the appointment of a new Assistant Secretary, the recommendation of the Committee to be reported to the Board for action."

The President subsequently appointed to act with him on this Committee Messrs. L. D. Rights, Chairman, Geo. H. Pegram, H. S. Crocker and Samuel T. Wagner.

Adjourned.

**REPORT IN FULL OF THE SIXTY-SIXTH ANNUAL MEETING,
JANUARY 15TH AND 16TH, 1919.**

Wednesday, January 15th, 1919 (10 A. M.).—The Sixty-sixth Annual Meeting was called to order in the Auditorium of the Engineering Societies Building, 39 West 39th Street, New York City; President A. N. Talbot in the chair; on the platform, Vice-Presidents G. S. Webster and G. W. Kittredge; Charles Warren Hunt, Secretary; and present, also, about 680 Members.

THE PRESIDENT.—The Annual Meeting is now convened. I wish to announce that I have appointed the following as Tellers to Canvass the Ballot for Officers: P. P. Farley, J. W. F. Bennett, A. S. Crane, James Forgie, L. V. Morris, C. U. Powell, J. W. Nelson, E. J. Rosencrans, and B. H. Wait, and their report will be ready for presentation before the close of the meeting.

The first order of business is the Annual Address of the President.
(The President delivered the Annual Address.*)

THE PRESIDENT.—The next order of business is the report of the Board of Direction, which will be presented by the Secretary.

THE SECRETARY.—Mr. President, as you have covered a great many of these items in your Address, perhaps I may be permitted to skip a little, to save time.

(The Secretary presented the Report of the Board of Direction.†)

THE PRESIDENT.—What action will you take on the report of the Board of Direction?

A MEMBER.—I move that it be received.

THE PRESIDENT.—Is there a seconder to this motion that this report be received?

(Motion duly seconded.)

THE PRESIDENT.—Is there any discussion on the motion, or any question about the report? Those favoring the adoption of this motion will say "aye"; contrary, "no". The motion is carried.

The report of the Secretary.

THE SECRETARY.—Mr. President, this is a report of the general receipts and disbursements, and I do not think there is any real reason for reading it. The balance sheet, which will be found on Page 13½ of the printed report, is to have an addition to it. It will be noted that in the Assets there is an estimated value of the lots owned by the Society, and the cost of the Building, less 2% annually for depreciation; also an item showing the equity of the Society in this Building at nearly \$500 000.

The Board has ordered that to this be added, in a foot-note, the total cost of the lots and building on the 57th Street property, which is

* See p. 29 of Papers and Discussions.

† See *Proceedings*, Am. Soc. C. E., Vol. XLV, p. 27 (January, 1919).

‡ See *Proceedings*, Am. Soc. C. E., Vol. XLV, p. 39 (January, 1919).

\$418 194.66, and the total amount paid to the United Engineering Society on account of the United Engineering Building, \$262 500, which means that the Society has actually spent about \$675 000 for the property which it owns and in which it has an equity. Otherwise, the opinion might still prevail, if you look at this balance sheet and see that we have nearly a million dollars to the good, that the Society had plenty of ready cash.

THE PRESIDENT.—The Treasurer's report.

(The Secretary read the Treasurer's Report.*)

THE PRESIDENT.—The reports of the Secretary and Treasurer are before you. Are there any questions?

CHARLES HANSEL, M. AM. SOC. C. E.—Mr. President, if it is in order, I feel, and I think we should all feel, that it would be a duty to help out the financial situation; and, in order to do that, permit me to suggest to the United Engineering Society a recommendation of our Society that we assess all members \$5 apiece. I do not know how I should offer that resolution, or if I should offer it. I offer it at this time only as a suggestion, as the members of this Society can easily enough pay \$5 or \$10 apiece, in order to give the Board of Direction a sum that will put us in a dignified and easy position.

If this is not the time to offer that suggestion, I hope an opportunity to do so will be afforded during the Business Meeting.

THE PRESIDENT.—What will you do with the reports?

(It was moved and seconded that the reports be received.)

THE PRESIDENT.—It is moved and seconded that the reports be received. If there is no discussion, those favoring the adoption of this motion will say "aye"; contrary, "no". The motion is carried.

The Secretary will present the report of the Committee to Recommend the Award of Prizes, and the action of the Board of Direction in relation thereto.

THE SECRETARY.—The Board of Direction appointed Messrs. W. C. Hoad, Peter Mogensen, and H. R. Safford a Committee to Recommend the Award of Prizes. Upon the recommendation of this Committee, the Board has awarded the medals and prizes for the year ending July, 1918, as follows:

THE NORMAN MEDAL to Paper No. 1396, "Multiple-Arch Dams on Rush Creek, California", by L. R. Jorgensen, M. Am. Soc. C. E.

THE J. JAMES R. CROES MEDAL to Paper No. 1388, "Tunnel Work on Sections 8, 9, 10, and 11, Broadway-Lexington Avenue Subway, New York City", by Israel V. Werbin,† Assoc. M. Am. Soc. C. E.

THE THOMAS FITCH ROWLAND PRIZE to Paper No. 1397, "The Reconstruction of the Stony River Dam", by F. W. Scheidenhelm, M. Am. Soc. C. E.

* See *Proceedings*, Am. Soc. C. E., Vol. XLV, p. 42 (January, 1919).

† Mr. Werbin resigned his membership in the Society on December 31st, 1917.

THE JAMES LAURIE PRIZE to Paper No. 1391, "Unusual Coffer-Dam for 1 000-Foot Pier, New York City", by Charles W. Staniford, M. Am. Soc. C. E.

THE COLLINGWOOD PRIZE FOR JUNIORS to Paper No. 1379, "Designing an Earth Dam Having a Gravel Foundation, With the Results Obtained in Tests on a Model", by James B. Hays, Jun., Am. Soc. C. E.

THE PRESIDENT.—The next order of business is the appointment of the Nominating Committee. The Secretary will present the report of the tellers on the ballots for suggestions for members of that committee.

The Secretary presented the report of the Tellers, as follows:

"To the Board of Direction:

"The undersigned tellers report the result of canvass of final suggestions for Members of the Nominating Committee in the several districts as follows:

"District No. 1.—Joseph J. Yates.....	153
John W. Hamilton.....	69
Charles Hansel.....	15*
Scattering	9
 Total	246
"District No. 3.—Friend P. Williams.....	38
R. V. Rose.....	24
E. A. Fisher.....	15
Scattering	4
 Total	81
"District No. 5.—J. S. Conway.....	57
R. M. Clayton.....	12
John C. Hoyt.....	11
Scattering	8
 Total	88
"District No. 6.—N. S. Sprague.....	49
Paul Didier.....	18
Morris Knowles.....	11
Scattering	15
 Total	93
"District No. 10.—F. E. Weymouth.....	38
F. T. Darrow.....	21
Robert Follansbee	14
Scattering	3
 Total	76

* A communication has been received from Mr. Hansel asking that his name be withdrawn.

<i>"District No. 11.—</i>	W. K. Barnard.....	22
	J. C. Nagle.....	18
	Fred A. Jones.....	15
	Scattering	12
	Total	67
<i>"District No. 13.—</i>	H. L. Haehl.....	37
	P. E. Harroun.....	23
	M. M. O'Shaughnessy.....	10
	Scattering	2
	Total	72

"Respectfully submitted,

"FREDERICK C. NOBLE,

"ALFRED D. FLINN,

"Tellers."

The Districts were taken up separately, and, by vote of the meeting, the following members of the Nominating Committee were appointed to serve for two years:

JOSEPH J. YATES.....	Representing District No. 1
FRIEND P. WILLIAMS.....	" " " 3
J. S. CONWAY.....	" " " 5
N. S. SPRAGUE.....	" " " 6
F. E. WEYMOUTH.....	" " " 10
W. K. BARNARD.....	" " " 11
H. L. HAEHL.....	" " " 13

THE PRESIDENT.—We come now to the reports of Special Committees. The first is the report of the Special Committee on Engineering Education, DESMOND FITZGERALD, Chairman.

DESMOND FITZGERALD, PAST-PRESIDENT, AM. SOC. C. E.—Mr. President and Fellow-Members: The Special Committee on Engineering Education, after about a dozen years of long and, I believe, faithful work, desires to present its Final Report; and, representing that Committee, I wish to thank the Society for its patient forbearance in allowing the Committee to continue this work without interruption. There are some engineering problems that have to be rushed through. There are others that you cannot rush. If you rush them you meet with failure; and this important matter of education is, I think, fairly to be ranked with the latter class.

When the Committee first took the matter in hand, it had to provide funds, and soon found that it was getting into water beyond its depth. The President, in his very excellent and able address this morning, has referred to the work of Special Committees as being an important part of the work of this Society, and I, for one, must say that I felt a

good deal of encouragement from those words, because, when the work is extended over so many years, one begins to feel that perhaps it has not been advanced as rapidly as it should have been; however, the Committee believes that this Final Report which it is now presenting, in the form of a report of the Carnegie Foundation, will prove of great value to those engaged in Engineering Education.

The early Committee had among its members Benjamin M. Harrod, Past-President, Am. Soc. C. E., and I do not think it ever had a more diligent worker or a more faithful and more interested member; and the members of the Committee felt his death very greatly. I felt it, especially, because I was in constant communication with him, and he never failed to give all his strength and intelligence to this difficult question.

Finally, after several years of investigation, the Committee concluded that it would require a very large sum of money and a very excellent organization, more important than it was felt the Society could provide for this subject; and, therefore, it was arranged to invite several other societies to join with this Society in a larger organization for the study of engineering education.

Now, that larger Committee has been working on this matter carefully for a good many years, and the Carnegie Foundation, after hearing all our representations on this matter, came to the conclusion that it would devote a large sum of money to this cause, and also help in any way possible. Finally, Dr. Mann was selected to head the investigation.

Now, a great many interesting things in connection with education have been brought out by this particular study. I shall not refer to many of them, but I would like to say a few words on one or two. Of course, the Rensselaer Polytechnic Institute was one of the first—and probably the first—established in this country. It was established to meet the calls of industrial manufacturers, and, in fact, the Institute of Technology, which followed later, was founded for the purpose of adding to the efficiency of the industries in this country. Later, the instruction took on more scientific forms of engineering and technology.

The Civil War changed a great many things in this country, and had a vast influence on education. Immediately after the Civil War it was very remarkable how our teaching changed, and the institutions themselves went through very noteworthy changes. Now, we, too, have just passed through a very great war, in many features of which our hearts have been wrung; but it is very doubtful if this war will produce the same changes in teaching as the Civil War, because our country has grown, developed, and we have only to look at our own Society and see what a remarkable showing it makes to-day, compared with its early days, to realize that the strength and power of the country are not to be affected in the same way that they were after 1865.

Dr. Mann's report is extremely interesting, and it is very well arranged. One of its great charms is its condensation. When it was

originally presented it contained an enormous mass of information, which he diligently condensed into its present form, and I think it is in a form which all can read with pleasure, and get results from that reading in a very short time.

This report is divided into three portions, the first of which deals with the present condition of education among the schools. Twenty typical schools were visited by Dr. Mann and very carefully studied.

The second part of the report deals with the engineering problems connected with technical education, and the third part offers some practical solutions in aid of those problems. One of the interesting results is that, when you consider the relation of engineering education to the industrial production of the country, out of 98 important manufacturing industries, 43% of the technical assistants in those industries possess engineering degrees.

Another interesting thing, to which I wish to call attention, is the fact that, of all the boys who enter the schools, 60% fail to be graduated. Some of the reasons for this are discussed in the report, and suggestions are offered.

Now, it seems to the Committee, Mr. President, that it is desirable that this report should be very carefully studied by the professors and teachers of engineering in this country; and I, as representing that Committee, would like to move that a committee of three be appointed by the President to confer with the other engineering organizations, in order to secure the careful study of this report.

THE PRESIDENT.—The Chairman of the Special Committee on Engineering Education presents the Final Report of the Committee, and moves that a committee be appointed to make a study of the report prepared by Dr. Mann.

(Motion duly seconded.)

MR. FITZGERALD.—The idea is this, and I would like to make the suggestion, that this Committee, consisting of men of eminence in the profession, should confer with other kindred societies, to bring about a careful study of this report among the teaching institutions in this country.

THE PRESIDENT.—There is also included in this motion that this Committee shall make an attempt to confer with committees of other societies and to develop a general discussion of the report throughout the country.

L. D. RIGGS, M. AM. SOC. C. E.—Mr. President, I would like to suggest that possibly this matter might be simplified by dividing the motion. I would like to offer an amendment to that effect. First, that the report be accepted, and that the committee be discharged with thanks.

THE PRESIDENT.—That is separate from this motion, I take it.

MR. RIGHTS.—I understand that the Committee has presented its Final Report. I would offer it as an amendment. (Motion duly seconded.)

THE PRESIDENT.—The motion is made that this be amended by accepting the Final Report of the Committee; it must be added to the other motion; is that right?

MR. RIGHTS.—That the Committee be discharged with thanks.

THE PRESIDENT.—And that the Committee be discharged with the thanks of the Society. Is there any discussion? Those favoring this amendment will say "aye"; contrary, "no". The motion is carried. Is there any discussion of the motion as amended? This brings about the appointment of the Committee by the Annual Meeting, which I think is not usual.

MR. FITZGERALD.—I think perhaps my motion was misunderstood—I moved that the President be authorized and requested to appoint this Committee. That does not mean that it was necessarily to be done at this Meeting.

THE PRESIDENT.—What standing, may I ask, will the Committee have: The standing of appointment by the Annual Meeting or by the Society? May I not suggest, if this is to be done, it may be well to have it referred to the Board of Direction in order that it may be appointed in the same way that other committees have been appointed.

H. P. EDDY, M. AM. SOC. C. E.—I move to amend the motion by reference to the Board of Direction. (Motion duly seconded.)

THE PRESIDENT.—The whole subject, including the acceptance of the report, may we not consider then informally; that this refers to the appointment of the committee and that the motion will be divided, taking up the appointment of the committee later?

Those favoring the reference of the report of the Committee to the Board of Direction, say "aye"; contrary, "no". The motion is carried.

Those favoring the motion that the report of the Committee be accepted and that the committee be discharged with the thanks of the Society will say "aye"; contrary, "no". The motion is carried.

THE SECRETARY.—May I interrupt the regular order of business for one moment? There are so many people in the room that this would be a good time to make a statement in regard to the excursion to-morrow, details of which could not be printed in the programme in full. I have asked Mr. Brush, Chairman of the Committee of Arrangements, if he will not make a statement respecting the time of the excursion to-morrow.

W. W. BRUSH, M. AM. SOC. C. E.—Your Committee regrets that it could not make any announcements as to the time and place for boarding the boat to take us to the Army Base. There is a great deal of difficulty in making any arrangement for transportation this year, primarily

on account of the time of the year; and, secondly, on account of the steamboat operators' strike.

We have been fortunate, through the courtesy of Commissioner Delaney, of the Department of Plant and Structures, of the City of New York, in securing for our use the Municipal ferry-boat, *Mayor Gaynor*. The boat will be in the west slip of the Staten Island Ferry Terminal, at the foot of Whitehall Street, Battery, at any time after 9 o'clock to-morrow, Thursday morning, and will leave at 9.45. You are to enter at the street level, using the gateway which is ordinarily used for the discharge of passengers. You must not go through the Ferry Terminal in boarding the boat. The tickets which have been issued for the excursion are to be shown at the gate to the attendant.

We go from the slip to the Army Base, arriving there at about 10 A. M. Luncheon will be served at 12.15 at the Army Base. After luncheon we will board the boat, leaving the Army Base, as nearly as possible, at 1.30 P. M., and go to the Newark Bay Shipyard of the Submarine Boat Corporation, arriving there at about 2.30 P. M. The boat will return, leaving the yard at 4.30 P. M.

There will be no special train for return to the city, but, if any member desires, it is possible to come back to the city by the special workmen's trains, which run from the yard at intervals of from 12 to 15 minutes, the earliest train being at 3.48 P. M. Anybody who wishes to return by train will have to get a ticket at the yard, where they are sold regularly, and travel on this train with the workmen. I have traveled on the train, by the way, which is pretty well crowded; the boat will be much more comfortable than the train for the return trip.

It is possible to reach the Army Base by the Fourth Avenue Subway, if anybody finds it necessary to go that way. You will find no difficulty; leave the train at the Subway Station which is nearest to 58th Street, and walk three blocks westward toward the water front—where you will find the Army Base.

The time is 9.45 A. M., and the place is the Staten Island Ferry Terminal, at the foot of Whitehall Street, Battery.

THE PRESIDENT.—The report of the Special Committee to Codify Present Practice on the Bearing Value of Soils for Foundations, Robert A. Cummings, Chairman.

ROBERT A. CUMMINGS, M. AM. SOC. C. E.—Mr. President and Members of the Society; on account of the war, this Committee suspended its activities during the past year, at the suggestion of the Board of Direction. It is contemplated, during the coming year, to continue the work where it left off in its last report; this will consist of the classification and definitions of soils.

This work was started three or four years ago; and questions were circulated among members of the Society, practically 10 000 letters being sent out, with the result that we received about 1% of replies.

The Committee concluded that, with the little information it had received, it was unnecessary to continue that phase of its work, because of the fact that the work could not be co-ordinated.

The Committee has practically decided upon the testing apparatus for field and laboratory work, but it is not yet ready to report on it.

The United States Bureau of Standards has been co-operating with the Committee, and the Sub-Committee of the Bureau has promised its report for the coming year. The Committee, with your consent, will continue its work.

THE PRESIDENT.—Any discussion on the Report of the Special Committee on Soils? If not, it will be accepted as a Progress Report.

The Report of the Special Committee on Stresses in Railroad Track will be presented by the Secretary.

**"PROGRESS REPORT OF SPECIAL COMMITTEE TO REPORT ON
STRESSES IN RAILROAD TRACK."**

"The Special Committee to Report on Stresses in Railroad Track, co-operating with a similar committee of the American Railway Engineering Association, presents the following report of progress:

"The conditions incident to the war have greatly interfered with the progress of the work of the Committee. Early in the year the call to government service took away the last of the technical assistants who had become trained in this very special work. Some temporary assistance was used during the summer and fall, and it is hoped now that a small technical staff may be again developed. As the work is very special, it is not easy to get the right help, even in peace times.

"During the year the data of the tests to find the effect of counter-weight of locomotive drivers, made late in 1917, on the track of the St. Louis-San Francisco Railway, have been worked upon with very interesting results. Tests were also made on the track of the Illinois Central Railroad to find the effect of counterbalance of the Mikado locomotive. Other tests were made on the Illinois Central Railroad and the Chicago, Milwaukee and St. Paul Railroad to determine the distribution of pressure immediately under the tie and also the stresses in the tie, and considerable work has been done in reducing the data.

"The Committee plans to study the results of the experimental data now available, and to take up the preparation of a report on the part of the subject so covered. It is believed, too, that sufficient information has now been accumulated to begin the discussion of the relation of the results to the principles governing the design of railroad track. It is expected, also, that the test work will be continued during the coming year.

"Respectfully submitted,

"The Special Committee to Report on Stresses in Railroad Track."

THE PRESIDENT.—Is there any discussion on this Report? If not, it will be accepted as a Progress Report.

The Report of the Special Committee on the Regulation of Water Rights will be presented by the Secretary.

THE SECRETARY.—Mr. President, this is in the form of a letter from F. H. Newell, M. Am. Soc. C. E., Chairman of the Committee.

"URBANA, ILLINOIS,
"DECEMBER 23, 1918.

"BOARD OF DIRECTION,

"American Society of Civil Engineers,

"33 West 39th Street, New York City.

"GENTLEMEN: The members of the Special Committee on a National Water Law have not been able to hold a meeting during 1918, because of the fact that one member, Major Hoad, was in France; another member, Mr. John H. Lewis, in Oregon; and all of us have been more than busy in connection directly or indirectly with war work. In the meantime, however, some valuable information has been collected and as normal peace conditions are resumed we expect to bring together the material with a view to presenting more definite conclusions.

"As Chairman of this Special Committee, I respectfully request that the Committee be continued for another year. I regret that it will probably be impracticable for me to attend the annual meeting, but in the event that I do not attend, I trust that this request will receive favorable consideration.

"Yours very truly,

"F. H. NEWELL."

THE PRESIDENT.—This letter may be taken as a Progress Report. If there is no discussion or action, it will be accepted as such.

Is there a Report from the Alfred Noble Memorial Committee?

THE SECRETARY.—I would like to make a very brief statement, Mr. President:

The project for the erection of the Alfred Noble Memorial has of course been held up, as stated in the Reports of the Committee published in *Proceedings*, on account of the War, but the Chairman of the Committee, Mr. Onward Bates, has asked me to state that under the present conditions the project is as much alive as ever in the minds of the Committee, and that the reasons which forced the suspension of construction of this typical Engineering Monument only add to the intensity of the desire of the Committee to complete it, and that it is the intention to proceed actively to that end when the way is open for making progress.

R. L. HUMPHREY, M. AM. SOC. C. E.—I would like to say a word with respect to the Alfred Noble Memorial—on the replica that is in Washington—and recommend to the Committee's attention the desirability of either removing it or putting it in proper order. I would like to say, further, that I pass that replica nearly every day, with many members of this Society. I have yet to hear a favorable report or opinion expressed as to the adequacy of this memorial; and I would like to call to the further attention of the Committee the desirability of reviewing the character of this memorial.

THE PRESIDENT.—There is no action necessary on that. The Report of the Committee on Development. Is Mr. Bates present? The Preliminary Report of this Committee was sent out to the membership in printed form, and has also been printed in *Proceedings*.^{*} It was hoped by the Committee that there might be a rather full discussion of the topics which were included in its report. If there is any one now who wishes to discuss this preliminary report, opportunity will be given. If not, it will be passed as a Progress Report.

"Announcements by the Secretary" is the next order of business.

THE SECRETARY.—Mr. President, the Board of Direction adopted a resolution at its meeting yesterday, based upon certain resolutions which had been adopted by the Brooklyn Engineers' Club. I will read these first.

BROOKLYN ENGINEERS' CLUB
117 REMSEN STREET
BROOKLYN, N. Y.

"Whereas, The Public Service Commission summarily dismissed about 350 engineering employees on December 31st effective at the close of work on that date due to action by the Board of Estimate on December 30th, and

"Whereas, Such action is detrimental to the best interests of the Engineering Profession and of the public generally, in that

"(a) The dismissal of a large number of needed employees is in complete disregard with the National Government's request at this time to keep all public work in progress in order to reduce the number of unemployed in the country due to the cessation of war industries and the return of large numbers of our soldiers from abroad;

"(b) The reduction in force below that necessary for proper supervision of construction work is contrary to public interest and good engineering practice;

"(c) The adoption of a budget arbitrarily fixing the number of engineering employees required in the conduct of the work was contrary to the recommendations of the Engineers in immediate charge of the work;

"(d) The treatment of these men in laying them off without notice so that their source of income is stopped immediately is reprehensible and unjust;

"(e) The unfair treatment of these men makes it increasingly difficult to get competent men to continue in the public service.

"In view of the preceding, it is herewith

"Resolved, That it is the sense of this meeting that these facts be brought to the attention of the Engineering Council of the United Engineering Societies for such action as it may deem desirable.

"The Secretary is instructed to transmit copies of this Resolution to the Secretaries of the four Engineering Societies composing the

United Engineering Society with the request that the matter be brought before each Society for similar action."

The following resolution was adopted by the Board of Direction on January 14th, 1919:

"The Board of Direction of the American Society of Civil Engineers, having considered the resolutions passed by the Brooklyn Engineers' Club in regard to the summary dismissal of about 350 engineer employees of the Public Service Commission, District No. 1, State of New York;

"Resolved, That on the statement of facts thus presented, that the dismissal of these employees, many of them specifically qualified for the difficult undertaking in which they were engaged, was not only eminently unjust and an offense to the Engineering Profession, but was directly opposed to the best interests of the City of New York, and therefore opposed to the best interests of the country;

"Resolved, That this Board, recognizing this to be a matter upon which the Engineering Council has properly taken prompt action, and understanding that a hearing of those directly concerned has been called for this afternoon, directs that the record of this action be filed at once with the Secretary of Engineering Council."

T. KENNARD THOMSON, M. AM. Soc. C. E.—Mr. President and Gentlemen; I would like to state a precedent for that. A few years ago the City of Calgary tried to discharge one of the city's engineers, under rather peculiar circumstances, on account of a bridge falling down. The Canadian Society of Civil Engineers took the matter up, and offered to make a complete investigation, and ascertain whose fault it was.

The result of that investigation was that the City of Calgary had to reappoint that engineer. I hope that Engineering Council will look after the interests of the 30 000 engineers of the National Societies.

J. V. DAVIES, M. AM. Soc. C. E.—I do not know that it is necessary, but I would like to move the endorsement of this Meeting of the action of the Board in drawing the attention of Engineering Council to this matter, and particularly to the fact that the construction of the work relating to rapid transit is now proceeding with no inspection supervision as to the character of the work now being carried on under contract.

(Motion duly seconded.)

THE PRESIDENT.—It is moved and seconded that the action of the Board of Direction in passing these resolutions be approved by the Meeting. Is there any discussion on this? Those favoring this motion will say "aye"; contrary, "no". Carried.

Any further announcements?

THE SECRETARY.—I have to announce, for the sake of the record, the election by the Board of Direction of 12 candidates as Members of this Society; of 53 candidates as Associate Members, and of 6 Juniors,

and the transfer of 15 Associate Members to the grade of Member, 1 Associate to the grade of Associate Member, and of 15 Juniors to the grade of Associate Member. I have all the names here.*

THE PRESIDENT.—It is not necessary to read them unless they are called for.

THE SECRETARY.—I have received one or two letters which may be of interest to the Meeting.

"NEW YORK, 290 BROADWAY,
"DECEMBER 27, 1918.

"MR. CHAS. WARREN HUNT,
Secretary, American Society of Civil Engineers,
33 West 39th St., New York City.

"DEAR MR. HUNT:—We are at present constructing the pneumatic foundations for the U. S. Assay Office at Wall and Broad Sts., New York City, and it occurred to us that this construction work might be of interest to some members of the Society at the time of the Annual Meeting.

"We will be very glad to welcome any members of the Society who care to see this work. The work is in an interesting stage at present, the caissons are to be of concrete in the form of a continuous coffer-dam to rock enclosing the gold vault for the Assay Office. Some of the caissons will be concreted standing 30 ft. above ground, while others will be in the course of sinking, so that it will be instructive to those who are not familiar with this class of work.

"If you decide to put this work on your schedule, we will be glad to have guides available for directing the party to the work.

"Yours very truly,

"THE UNDERPINNING & FOUNDATION CO.
"FRANCIS L. PRUYN,
"Vice-President."

"50 CHURCH STREET, NEW YORK,
"DECEMBER 27, 1918.

"DR. CHARLES WARREN HUNT,
"Secretary, Am. Soc. C. E.
33 West 39th St.

"DEAR DR. HUNT: The foundations for the New Assay Building on Wall St. ought to be at a very interesting stage at the time of our annual meeting, so, if any of our members care to visit the site, I am sure that the Government Superintendent, Mr. B. A. Appleyard; Chas. T. Wills Co. General Contractors; The Underpinning Foundation Co., and myself will be glad to give any information possible. The work consists of underpinning the old Sub Treasury and Gallatin Bank Buildings now completed and construction of new vaults 30 feet below the ground water surface by means of six pneumatic caissons, 8 feet wide and from 20 to 26 feet long, and two of 5 feet 6 inches in width.

* See page 118.

"These caissons will be entirely of reinforced concrete, and the various stages of the work should then be in operation. There will also be six smaller square caissons for foundations for the building.

"The deep cellar portion will contain nothing but the vaults, and will be so arranged as to have a passageway all around the vaults and a clear space under the vaults which will always be open to observation from the upper floor by means of inclined mirrors at the bottom of the passageways—or spaces between the side walls and the vaults.

"The original plans were made by Col. J. Hollis Wells, member of the American Society of Civil Engineers, for the Government.

"Yours respectfully

"T. KENNARD THOMSON,
"Consulting Engineer for the Supervising
Archt. of the Treasury Dept."

THE SECRETARY.—These letters, however, were not received in time to add this feature to our regular programme; and I simply make this announcement so that Members who are interested in that work can take advantage of it.

I have a letter, also, from Daniel H. Cox, Manager of the Division of Steel Ship Construction, also signed by R. J. Wig, Head of the Concrete Ship Section.

"140 NORTH BROAD STREET,
"PHILADELPHIA, PA.,
"DECEMBER 31ST, 1918.

MR. CHARLES WARREN HUNT,
Secretary, American Society of Civil Engineers,
33 West 39th Street, New York City.

"DEAR SIR: We have received a number of inquiries of late from engineers desiring to inspect one of our concrete ships under construction. There are several of them who will be in attendance at the annual meeting of the Society.

"We have under construction in the yard of the Fougner Ship-building Company, Flushing Bay, N. Y., a 3500-ton concrete ship, the hull of which is practically complete, and it is anticipated that this ship will be launched early in February.

"It has been suggested that you might wish to extend a general invitation to all members of the Society and possibly have a special excursion to inspect this boat. I would be very glad to extend such an invitation to all members.

"Very truly yours,
"DANIEL H. COX,
Manager, Div. of Steel Ship Construction.
"By R. J. WIG,
Head, Concrete Ship Section.

THE SECRETARY.—I have to announce, Mr. President, the following deaths.*

THE PRESIDENT.—The next in order is "New Business". Has any Member any business to present to the Meeting?

R. S. BUCK, M. AM. SOC. C. E.—Mr. President and Gentlemen; you all doubtless have already realized the fact that the question of unemployment is already acute, and becoming more so. After discussing the matter with some of the members of the Society, it is proposed that certain resolutions at this Meeting might carry weight in abating the difficulty that is ahead of us in this regard. Therefore, I would like to present the following resolutions:

"Whereas, It is vital to the peace and welfare of our country that, during the necessary reconstruction period following the war, the number of unemployed be reduced as much as possible; and

"Whereas, The development of transportation, sanitation, power, and public utilities generally is necessary to the development and prosperity of the country; and

"Whereas, The curtailment of needed public works during the period of the war has retarded the development of the country; and

"Whereas, The speediest and most effective means to prevent the suffering, distress, and demoralization resulting from unemployment is afforded by public works; and

"Whereas, The public welfare and confidence, upon which industry generally depends, require that the construction of public works be vigorously prosecuted; therefore, be it

Resolved, That the American Society of Civil Engineers, assembled in their Sixty-sixth Annual Meeting, this fifteenth day of January, 1919, desires to record its profound conviction that public works should be carried forward to the fullest extent consistent with sound judgment, not only for fundamental economic reasons, but for humanitarian reasons, to furnish employment for all who can properly claim employment, especially returning soldiers; and be it further

Resolved, That copies of this resolution be forwarded to such Federal, State, and municipal authorities as may be able, in the opinion of the Executive Committee of the Board of Direction of the Society, to promote the purposes of these resolutions."

THE PRESIDENT.—The resolutions have been presented; what action shall be taken?

(Motion duly seconded.)

THE PRESIDENT.—The motion has been made and seconded that the resolutions be adopted by the Annual Meeting. Is there any discussion on this? If not, those favoring the motion to adopt these resolutions will say "aye"; contrary, "no". It is carried.

Is there any further new business?

M. O. LEIGHTON, M. AM. SOC. C. E.—May I be allowed a few minutes to make an announcement?

THE PRESIDENT.—We should be glad to have you do so.

MR. LEIGHTON.—Mr. President and Gentlemen; in the last *Proceedings* of the Society you probably noted that Engineering Council was contemplating, and, in fact, had approved, a tentative plan presented by Mr. Philip N. Moore to organize a National Service Committee, with headquarters in Washington, D. C.; and the functions of that Committee, so far as they can be foretold and planned at the present time, were set forth in the *Proceedings*.

Although no public announcement has been made of the final action of Engineering Council, no secret has been made of the fact that the National Service Committee has been organized, and its office at the present time is open in Washington and is endeavoring to do such preliminary business as it can, prior to formal announcement and prior to the acceptance of election by all the members who were appointed by Engineering Council.

The speaker has been honored by selection as Chairman of that Committee. There is a very large amount of work to be done, and there is a very large amount of work to be avoided. It is realized that this Committee is going to be very successful, or it is going to be a very great nuisance, and that the principal difficulty at the present time is to determine what shall be selected, out of the great mass of obvious things, to be done first.

The Committee is entirely dependent on this and the other Founder Societies. It is entirely dependent on the individual membership of those societies. We must make use of you, as we hope that sometime you will be able to make productive and satisfactory use of us; but we would like to have you understand that though this is a Committee directly of Engineering Council, it is nevertheless your Committee. We need your help, we need your suggestions. If you can think of any way by which this Committee can be made of service, please address the Committee accordingly.

You know there is a heap of loose thinking going on about the world just now; and the help of engineers and the engineer's habits of thought are exceedingly essential to our progress and to our welfare. This National Service Committee hopes to act for you in this way. You will receive announcements from time to time of work and progress; but we hope that in the meantime you will be thinking, that you will be sending to us letters with suggestions, and taking part to the utmost in the progress of this Committee's work. I thank you, Mr. President.

THE PRESIDENT.—The chair wishes to say that it believes that the appointment of Mr. Leighton as Chairman of this Committee, with his long residence in Washington and his experience with governmental matters, is starting the Committee under very favorable auspices; and he hopes that the members of the Society will do everything in their power to help the Committee from time to time.

Is there anything further in the way of new business? Does Mr. Hansel wish to take up the point which he made earlier in the Meeting?

MR. HANSEL.—Mr. President, we have just heard of the efforts to do something in Washington, and I would like to know how they are going to finance the work. It occurs to me that this Society and the others of the Founder Societies should be represented in Washington, not only by the genius of the engineer, but by the support of such finances as will enable them to entertain cabinet officers, ambassadors, all the big men that come to Washington. I want to see our Society at Washington able to do at least as great things in the general upbuilding of the country as the other societies.

Now, I understand that our funds are quite low, and it occurs to me that it needs no sacrifice at all for the four Founder Societies to subscribe at least \$5 each member, and others who feel that they can do better will no doubt do so.

Now, I realize that you are operating through the United Engineering Society. Of course, I understand that. I do not belong to that Society. I have been asked why I do not, and I answer that the United Engineering Society is a clearing house, as it were, for the things before the four Founder Societies.

Now, if it is in order, I should like to offer a resolution that it is the sense of this Meeting that the four Founder Societies join in asking their Members for a subscription of a minimum of \$5 each, to be handled as best seems fit by Engineering Council.

A MEMBER.—I second the motion, Mr. President, to get it before the Meeting.

THE PRESIDENT.—The motion is made and seconded that it is the sense of this Meeting that the four Founder Societies should join in asking subscriptions from the Members of \$5 each—I believe that was the sum named—to provide funds for its special services. Is there any discussion on this?

MR. LEIGHTON.—Mr. President, as Mr. Hansel asked a question at the outset of his remarks concerning the support of the Washington office, perhaps you would like to know, before you vote on that motion, that this office in Washington is, for the present, at least, to be supported by a saving, or a residue, of the appropriation made to Engineering Council for the year 1918. Something like \$2 500 or \$3 000 that the Council saved, or did not spend, is to be re-appropriated for the support of the office in Washington during 1919.

Of course, that makes a rather small amount for support. It provides for a modest staff; and perhaps it was well that no more money was available, because it made a modest start necessary. The history of such movements in Washington usually has been that they have started with a blast of trumpets, spread themselves over the whole floor of an office building, and in a short time shrunk away to a grease spot.

Engineering Council did not want this to happen. It is expected that at some proper time in the future, when this movement grows, we shall need a lot more money; and the \$5 subscription from the Members of all the Founder Societies will be very welcome; but, for the present, at least, the amount that is available for the support of the Washington office is coming from what Engineering Council saved last year.

C. J. TILDEN, M. AM. Soc. C. E.—Mr. President, I should like to know just where this office is located in Washington, and just what this Committee is now doing.

THE PRESIDENT.—Will Mr. Leighton give the information?

MR. LEIGHTON.—The office is at No. 502 McLachlen Building, which is on the corner of Tenth and G Streets, N. W.

The Committee has not yet had any meetings, because all the nominees have not yet accepted membership. The chairman has sent letters, to the members who have accepted membership, enclosing copies of the tentative plans of Mr. Philip N. Moore and asking those members if they would criticise them, make additional suggestions, and prepare themselves to come to a preliminary meeting.

The Chairman of the Committee at the present time is wondering just what he ought to do next, and he has come to this Annual Meeting of the American Society of Civil Engineers largely for the purpose of finding out. You see, I am very frank about it. This job is so big, it has so many ramifications, that I am free to confess I do not know what should be done next, and until I have a chance to orient myself and get some suggestions from the members of the Committee, and especially from the members of the Society, I am not sticking out my chest very much.

MR. DAVIES.—Before this motion is put, Mr. Chairman, I would like to ask for some information. I am very close up, but I declare I do not know a thing about what the motion is for, excepting that we are to be asked for \$5. I am sure many in the room, and especially those in the rear of the room, have less idea than I have about what it is for.

Personally, I think it is an improper proceeding to come to this Meeting and request the other National Societies to put up \$5 per member. I have no objection to using that money for any proper purpose, but I do not see, and I do not understand, what is to be done with it when it is obtained.

THE PRESIDENT.—Will the maker of the motion make that clearer?

W. H. WILEY, M. AM. Soc. C. E.—I move that the motion be laid on the table. (Motion duly seconded.)

THE PRESIDENT.—A motion is made to lay the motion on the table, which has been seconded. Those favoring the motion will say "aye"; contrary, "no". It is carried.

THE PRESIDENT.—I am not sure, gentlemen, that that does not mean that you may not be asked for money for such a cause at some time in the future. Is there any further business to be presented? If not, we will have the report of the tellers on the election of officers for the ensuing year.

(The Secretary read the Report of the Tellers, as follows:)

"33 WEST 39TH ST.,
"NEW YORK, N. Y.
"JANUARY 15, 1919.

"To THE SIXTY-SIXTH ANNUAL MEETING
AMERICAN SOCIETY OF CIVIL ENGINEERS:

"The Tellers appointed to canvass the ballots for Officers of the Society for 1919 report as follows:

"Total number of ballots received.....	1481
Ballots without signature.....	19
" stamped, not signed.....	37
" from members in arrears of dues.....	11
 Total number not entitled to vote.....	67

Ballots canvassed.....	1414
Defective	none

"For President:

FAYETTE SAMUEL CURTIS.....	1405
Scattering	6

"For Vice-Presidents:

HERBERT SAMUEL CROCKER.....	1398
LEONARD METCALF.....	1385
Scattering	8

"For Treasurer:

ARTHUR SMITH TUTTLE.....	1411
Scattering	1

"For Directors:

District No. 1 {	GEORGE HALLETT CLARK.....	1387
JACOB STINMAN LANGTHORN.....		1381
Scattering		5

District No. 2 {	CHARLES CLEMENT ELWELL.....	1368
Scattering		1

District No. 6 {	WILLARD BEAHAN.....	1362
Scattering		5

District No. 8	{ JOHN WATSON ALVORD.....	1367
	Scattering	4
District No. 13	{ CARL EWALD GRUNSKY	1348
	Scattering	14

"PHILIP P. FARLEY, *Chairman*,
 J. W. F. BENNETT,
 ALBERT S. CRANE,
 JAMES W. NELSON,
 EDWIN J. ROSENCRANS,
 BERTRAND H. WAIT,
 CHARLES U. POWELL,
 "Tellers."

THE PRESIDENT.—The Members, whose names have been read, having the highest votes for these respective offices, are declared elected officers of the Society for the ensuing term.

Before asking the new President to come forward, I wish again to express to the Members my great appreciation of the honor conferred upon me, and the confidence put in me, in electing me President of the Society. I wish to say, too, that I have very much enjoyed the work with the Board of Direction, and I shall always value the honor thus conferred upon me.

Will Past-President Herschel and Past-President Stearns escort Mr. Curtis, the President-Elect, to the platform,

Mr. Curtis, I wish to greet you as the fiftieth President of the American Society of Civil Engineers.

FAYETTE SAMUEL CURTIS, PRESIDENT, AM. SOC. C. E.—Members of the American Society of Civil Engineers, at this time I do not care to inflict upon you any remarks of my own, although possibly admissible; all that I have to say is that I thank you for the honor conferred upon me in electing me President of this Society.

THE SECRETARY.—The only announcement I think it is necessary to make is that luncheon will be ready at 1 o'clock, on the 5th floor, and that members of the Board of Direction are asked, immediately upon adjournment of this Meeting, to go to the 16th floor, where, in the Past-Presidents' room, a meeting of the Board of Direction will be held and where luncheon will be served to them.

THE PRESIDENT.—You have heard the notice given to you by the Secretary. Please take notice and govern yourselves accordingly.

If there is no other business, gentlemen, I declare the Business Meeting adjourned.

EXCURSIONS AND ENTERTAINMENTS AT THE SIXTY-SIXTH ANNUAL MEETING

Wednesday, January 15th, 1919.—After the Business Meeting, in the Auditorium of the Engineering Societies Building, lunch for about 650 members was served.

At 3 P. M. Brig.-Gen. R. C. Marshall, Jr., Chief of Construction Division, U. S. A., addressed the Society on "The Construction Work Carried on in the United States During the War", illustrating his remarks with lantern slides. About 600 members were present.

At 9 P. M. there was a Reception to the President, in the large ballroom of The Biltmore, at which there was an attendance of about 350 members and guests.

Thursday, January 16th, 1919.—The day was devoted to an excursion to the Brooklyn Army Supply Base, by invitation of the Construction Division, U. S. A., Col. H. S. Crocker, M. Am. Soc. C. E., in charge; and to the Newark Bay Shipyard of the Submarine Boat Corporation.

The excursion was made on the Municipal Ferry-boat *Mayor Gaynor*. The boat, carrying about 750 members and guests, left the slip at the foot of Whitehall Street at 10 A. M. and proceeded at once to the Army Base. After inspecting the docks, pier sheds, terminal yards, and the large reinforced concrete warehouses, the party was entertained at luncheon by the Turner Construction Company, the general contractors for the project. The party then re-embarked and proceeded to the Newark Bay Shipyard, where the afternoon was spent in inspecting the extensive plant and the numerous ships under construction. The party returned by the steamer to New York, arriving at about 7 P. M.

During the afternoon a party of about 20 members accepted the invitation of the Fougner Shipbuilding Company to visit their yard at Flushing and inspect a large concrete ship under construction.

At 8.30 P. M., in the Auditorium, Brig.-Gen. S. T. Ansell, Acting Judge Advocate General, U. S. A., delivered an address on the war and the American soldier. At this function about 650 members were present, and, following it, there was a social and informal Smoker, at which the attendance was about 750.

The following list contains the names of 933 members of various grades who registered as being in attendance at the Annual Meeting. The list is incomplete, as some members failed to register, and it does not contain the names of any of the guests of the Society or of individual members. It is estimated that the total attendance was about 1,200.

Abbot, F. V....Washington, D. C. Aertsen, G.....Philadelphia, Pa.
Abbott, C. P....White Plains, N. Y. Aiken, W. A.....Pottstown, Pa.
Adams, E. G.....New York City Aikenhead, J. R....New York City

Aims, W. I.....	New York City	Bascome, W. R.....	New York City
Alderson, A. B.,	West Hartford, Conn.	Basinger, J. G.....	New York City
Alexander, A.....	New York City	Bass, F. H.....	Minneapolis, Minn.
Alexander, H. J....	New York City	Bassett, W. M....	Worcester, Mass.
Allaire, A.....	New York City	Baucus, W. I..	San Pedro de Macoris, Dominican Republic
Allaire, D. A.....	Brooklyn, N. Y.	Baughman, C. A .	Hog Island, Pa.
Allen, C. F.....	Boston, Mass.	Beahan, W.....	Cleveland, Ohio
Allen, E. Y.....	New York City	Bean, E. D.....	Bridgeport, Conn.
Allen, F. W....	Mt. Vernon, N. Y.	Bean, G. L.....	Philadelphia, Pa.
Allen, H. D.....	Newark, N. J.	Bear, E. R.....	Wheeling, W. Va.
Allen, K.....	New York City	Becker, R. C.....	New York City
Alvord, J. W....	Washington, D. C.	Beekman, J. V., Jr.	Boston, Mass.
Ammann, O. H.,	South Amboy, N.J.	Beggs, G. E.....	Princeton, N. J.
Anderberg, E.....	New York City	Belknap, F. W....	New York City
Anderson, R. H...	New York City	Belknap, J. M...	Manhasset, N. Y.
Anderson, W. T...	New York City	Belzner, T.....	New York City
Andrews, G. C....	Buffalo, N. Y.	Bennett, J. W. F...	New York City
Andrews, H. S..	Mt. Vernon, N. Y.	Bensel, J. A.....	New York City
Archer, A. R.....	New York City	Berger, B.....	New York City
Armstrong, A. F....	Albany, N. Y.	Beswick, J. E.,	New Brighton, N. Y.
Armstrong, W. R...	Omaha, Nebr.	Bettes, C. R.	Far Rockaway, N. Y.
Arnston, J. A.	Perth Amboy, N. J.	Betts, R. T.....	New York City
Ashbaugh, L. E....	New York City	Bigelow, W. W.....	Boston, Mass.
Ashmead, P. H....	New York City	Bilyeu, C. S.....	New York City
Atkinson, A.	New Brunswick, N. J.	Bixby, W. H.....	Chicago, Ill.
Atwater, H. C.....	New York City	Blair, C. M....	New Haven, Conn.
Atwood, T. C.....	Baltimore, Md.	Blakeslee, C....	New Haven, Conn.
Auryansen, F.....	Jamaica, N. Y.	Blanchard, A. H...	New York City
Austin, W. E.....	New York City	Blanchard, R. K...	New York City
Auten, C. I....	Youngstown, Ohio	Bleistein, B. J.....	Astoria, N. Y.
Babcock, W. S.....	New York City	Blodgett, J.....	New York City
Bailey, A. R.....	New York City	Boardman, C. S....	Buffalo, N. Y.
Baker, F. A.....	Newark, N. J.	Boardman, H. E...	New York City
Baldwin, W. J....	New York City	Boardman, H. S.....	Orono, Me.
Ballinger, W. F..	Philadelphia, Pa.	Boardman, W. H...	Newark, N. J.
Bamford, W. B....	Belmar, N. J.	Bogart, John.....	New York City
Baptiste, E. E...	Jersey City, N. J.	Bogert, C. L....	New York City
Barnett, R. P....	New York City	Bond, E. A.....	New York City
Barney, P. C....	New York City	Boniface, A.....	New York City
Barney, S. E.....	New York City	Bontecou, D....	New York City
		Boorman, K. M....	New York City

Borough, E. W....Brooklyn, N. Y. Castleman, F. L....Pencoyd, Pa.
Bouton, H. R....New York City Cerny, J. W....Brooklyn, N. Y.
Bower, C. P....Philadelphia, Pa. Chace, I. M., Jr.,
Bowlby, H. L....Washington, D. C. New Bedford, Mass.
Brackenridge, J. C. New York City Chappell, C. E.,
Bradley, F. E....New York City Camp Humphreys, Va.
Bramwell, G. W....New York City Chase, C. E....Poughkeepsie, N. Y.
Breitzke, C. F....Boonton, N. J. Chase, C. F....New Britain, Conn.
Brennan, J. L....New York City Chase, J. C....Derry Village, N. H.
Breuchaud, J....New York City Chase, R. D....New York City
Brewer, B....Waltham, Mass. Chorlton, W. H....New York City
Bronson, H. F....Riverhead, N. Y. Christian, G. L....Yonkers, N. Y.
Brooks, J. P....Potsdam, N. Y. Cilley, M....New York City
Brower, I. C....Washington, D. C. Clapp, S. K....Grand Gorge, N. Y.
Brown, B. S....Boston, Mass. Clark, A. E....New York City
Brown, L. F....New York City Clark, G. H....New York City
Brown, T. E....New York City Clark, W. G....New York City
Brown, W. E....Brooklyn, N. Y. Clarke, E. W....Flushing, N. Y.
Brown, W. N....Washington, D. C. Clarke, G. C....New York City
Brush, W. W....New York City Clarke, St. J....Bogota, N. J.
Buck, H. R....Hartford, Conn. Class, C. F....Harrisburg, Pa.
Buck, R. S....New York City Closson, W. G....Brooklyn, N. Y.
Buehler, W....Chicago, Ill. Cobb, L. R....New York City
Buettner, O. G. H....New York City Cochrane, V. H....Washington, D. C.
Burgess, G. H....Albany, N. Y. Codwise, H. R....Brooklyn, N. Y.
Burpee, M....Houlton, Me. Coffin, T. De L....Katonah, N. Y.
Burr, W. H....New York City Cohen, A. B....East Orange, N. J.
Burrowes, P. de N....Russell, Va. Cohen, C....New York City
Bush, A. L....Philadelphia, Pa. Cole, C. L....Meriden, Conn.
Bush, H. D....Baltimore, Md. Cole, E. S....New York City
Bush, L....Washington, D. C. Cole, G. N....New York City
Byers, B. B. F....Baltimore, Md. Cole, H. J....Washington, D. C.
Cadwallader, W. L. New York City Coleman, J. F....Mobile, Ala.
Cahn, E....New York City Collier, B. C....Allentown, Pa.
Campbell, C. C....Camp Merritt, N. J. Collins, A. L....Santa Cruz, Cal.
Collins, C. D....New York City Collins, T. E....Elizabeth, N. J.
Carmalt, L. J....New Haven, Conn. Colyer, C. I....Montclair, N. J.
Carpenter, C. E....New York City Conard, W. R....Burlington, N. J.
Carpenter, F. W....Cornwall, N. Y. Conger, A. A....Worcester, Mass.
Carstarphen, F. C....Trenton, N. J. Conklin, C. D., Jr....Cheltenham, Pa.
Casani, A. A....Pittsburgh, Pa. Connelly, J. A. A....New York City
Castle, S. N....New York City Constable, H....Kingston, N. Y.

Constant, F. H....Princeton, N. J. Davis, C. E....Philadelphia, Pa.
Cooksey, R. M....Baltimore, Md. Davis, J. L....Mount Vernon, N. Y.
Cooley, M. E....Ann Arbor, Mich. Day, E. B.....New York City
Coombs, A. W....New York City Degnon, N. G....Jamaica, N. Y.
Coombs, S. E....New York City Deiser, N. A....Brooklyn, N. Y.
Cornell, J. N. H....New York City Delson, I.....Stapleton, N. Y.
Cornell, J. W....Brooklyn, N. Y. Desmond, T. C....New York City
Covert, C. C.....Albany, N. Y. Develin, R. G...Philadelphia, Pa.
Crane, A. S.....New York City Devlin, H. S.....Harrisburg, Pa.
Craven, A. S....Philadelphia, Pa. De Witt, P. H.East Orange, N. J.
Creager, W. P....New York City Deyo, S. L. F.....New York City
Crellin, E. W.....Pittsburgh, Pa. Diebitsch, E.....New York City
Cresson, B. F., Jr. New York City Dimon, D. Y.....Passaic, N. J.
Cresson, J.....Norristown, Pa. Dingman, C. F....Palmer, Mass.
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Crider, J. L.Mount Vernon, N. Y. Donham, B. C....New York City
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Crocker, H. S....Brooklyn, N. Y. Doron, C. S.....New York City
Crooks, C. H.....New York City Dorrance, W. T.New Haven, Conn.
Cross, H.....New York City Dougherty, R. E.,
Crowell, F. S.....New York City White Plains, N. Y.
Cuddeback, A. W..Paterson, N. J. Doyen, G. E.....New York City
Culgin, G. W....New York City Dresser, G. L.....New York City
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Culyer, T. C....Mt. Kisco, N. Y. Dunham, W. R., Jr.,
Cummings, R. A. .Pittsburgh, Pa. New Haven, Conn.
Cummings, R. A., Jr., Pittsburgh, Pa.
Cummins, C. A....Baltimore, Md. Dunn, H. L...New London, Conn.
Curtis, C. E.....Ithaca, N. Y. Dutton, C. H....Providenee, R. I.
Curtis, F. S.....Boston, Mass. Dykeman, C. F....Brooklyn, N. Y.
Curtis, V. P....Worcester, Mass. Earle, T.....Bethlehem, Pa.
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Darville, M. A....New York City Edwards, L. N.,
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Davis, A. P....Washington, D. C. Ehle, B.....Yonkers, N. Y
Davis, B. H.....New York City Eide, T.....New York City
Ellendt, J. G.....New York City Elwell, C. C....New Haven, Conn.

English, H. L. . Washington, D. C. Franklin, C. M. Mt. Vernon, N. Y.
Evers, R. Brooklyn, N. Y. Fraser, C. E. New York City
Ewing, W. W. Cranford, N. J. Fraser, E. A. New York City
Fraser, R. M. Rome, N. Y.
Farley, J. M. . White Plains, N. Y. Freeman, J. R. Providence, R. I.
Farley, M. M. . Camp Shelby, Miss. Freeman, M. H. Brooklyn, N. Y.
Farley, P. P. New York City French, A. W. Worcester, Mass.
Farnham, A. B. Pittsfield, Mass. French, H. New York City
Farnham, R. Philadelphia, Pa. French, J. B. New York City
Farrington, H. P. New York City Fry, A. B. Brooklyn, N. Y.
Fay, F. H. Boston, Mass. Fuller, A. H. Easton, Pa.
Federlein, W. G. New York City Fuller, W. E. New York City
Feiner, M. A. New York City Furber, W. C. Philadelphia, Pa.
Fellows, F. J. Hollis, N. Y.
Ferguson, J. N. Boston, Mass. Gallogly, A. V. New York City
Ferguson, J. W. Paterson, N. J. Gardiner, F. W. New York City
Ferguson, W. E.,
Hastings-on-Hudson, N. Y. Gardiner, J. deB. W.,
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Fetherston, J. T.,
Muscle Shoals, Ala.
Files, T. H. New York City
Fisher, E. A. Rochester, N. Y.
Fitzgerald, W. E.,
New Brunswick, N. J.
Fitzmaurice, E. J.,
Philadelphia, Pa.
Fleischmann, L. New York City
Fletcher, R. Hanover, N. H.
Flinn, A. D. New York City
Forbes, F. B. New York City
Ford, F. L. New Haven, Conn.
Ford, W. H. Philadelphia, Pa.
Forgie, J. New York City
Forrest, C. N. Maurer, N. J.
Forster, A. O. Brooklyn, N. Y.
Foss, F. E. New York City
Foster, E. H. New York City
Fowler, C. E. New York City
Fox, W. F. Rockville Center, N. Y.
Francis, H. N. Providence, R. I.
Frank, A. H. Brooklyn, N. Y.
Frankland, F. H. New York City
Franklin, B. Philadelphia, Pa.

Gardner, H. C. Lancaster, Pa.
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Gaston, L. P. New York City
Gausmann, R. W. New York City
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Gifford, G. E. New York City
Gildersleeve, G. S. New York City
Giles, J. A. Binghamton, N. Y.
Gillespie, R. H. New York City
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Gilman, C. New York City
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Goldmark, H. New York City
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Goodwin, R. E. Weehawken, N. J.
Gould, C. M. New York City
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Gowen, S. Phoenixville, Pa.
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Grunsky, C. E. San Francisco, Cal. Henderson, A. R.Jersey City, N. J.
Gutman, D.....Pelham, N. Y. Henry, P. W.....New York City
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Hall, M. W.....New York City Higgins, C. H....New York City
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Haskell, E. E.....Ithaca, N. Y. Holden, C. A.....Hanover, N. H.
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Hoyt, W. H.....Duluth, Minn.	Keeler, C. H.Ottawa, Ont., Canada
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Hulbert, E. C.....Wampum, Pa.	Ketchum, M. S.....Boulder, Colo.
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Hulse, S. C.....Bedford, Pa.	Kimball, F. C.....Summit, N. J.
Humphrey, R. L.Philadelphia, Pa.	Kinsey, W. A....Newark, N. J.
Hunt, C. E.....New York City	Kirkwood, H. C...Flushing, N. Y.
Hunt, Chas. Warren, New York City	Kittredge, G. W...New York City
Hunt, W. H.....Brooklyn, N. Y.	Knight, E. K.....New York City
Hurd, H. L.....New York City	Knight, H. M....Montclair, N. J.
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Hutchinson, F. D ..New York City	Kornfeld, A. E....New York City
Huttenloch, M. W.Montclair, N. J.	Kraus, A.....New York City
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Hyde, H. E.....Ithaca, N. Y.	Lanagan, F. R....Albany, N. Y.
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Hyman, H. A....New York City	Landreth, W. B., Schenectady, N. Y.
Ilsley, A. B.....Charlotte, N. C.	Lang, F. A.....New York City
Immick, H. D....New York City	Langthorn, J. S....New York City
Irwin, J. C.....Boston, Mass.	Larsson, C. G. E..New York City
Jackson, J. F ..New Haven, Conn.	Latey, H. N.....New York City
Jacobs, R. H.....New York City	Latimer, C. A....New York City
Joachimson, M....New York City	Lavis, F.....New York City
Johannesson, S....New York City	Lawrence, R. J..Philadelphia, Pa.
Johnson, G.....Boston, Mass.	Lawton, F. T.....Jamaica, N. Y.
Johnson, G. A..Washington, D. C.	Leavitt, C. W.....New York City
Johnson, N. C....New York City	Lee, W. B.....New York City
Johnston, J. A..Springfield, Mass.	Leffingwell, F. D..Montclair, N. J.
Jones, H. L.....New York City	Lehlbach, G.....Newark, N. J.
Jones, S. R.....New York City	Leighton, M. O.Washington, D. C.
Jordan, L. C....Morsemere, N. J.	Leser, H.....New York City
Joslin, H. V.....New York City	Lesley, R. W....Philadelphia, Pa.
Kaestner, A. C....New York City	Levy, J. I.....Bayonne, N. J.
Kalberg, S. A...Springfield, Mass.	Lex, W. I.....Philadelphia, Pa.
	Lindenthal, G.....New York City
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Lippincott, J. B....Los Angeles, Cal.
Lo, Y.....New York City
Loewe, D. L....Cranford, N. J.
Lobo, C.....Brooklyn, N. Y.
Logan, J.....Mount Holly, N. Y.
Lohr, W. S.....Philadelphia, Pa.
Look, M. J.....Kingston, N. Y.
Loomis, H.....New York City
Loweth, C. F.....Chicago, Ill.
Lucas, E. W. V. C. New York City
Lucas, G. L.....New York City
Ludwig, J. A.....New York City
Lueder, A. B....Morristown, N. J.
Lundie, J.....New York City
Lyndon, L.....New York City

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MacDonald, C. White Plains, N. Y.
MacFeeters, J. O. Glen Ridge, N. J.
MacGregor, R. A.. New York City
Macksey, H. V....Woburn, Mass.
MacNaughton, P. J.,
Philadelphia, Pa.
Macomb, J. deN., Jr.,
Flushing, N. Y.
McCarthy, D. F. Bronxville, N. Y.
McClintock, J. R.. New York City
McCollough, C. A. New York City
McComb, D. E.. Washington, D. C.
McDowell, F. F....New York City
McIntyre, W. A....Ardmore, Pa.
McIntyre, W. J. Morristown, N. J.
McKean, A. M....Brooklyn, N. Y.
McLean, A.....Brooklyn, N. Y.
McLure, N. R.....Strafford, Pa.
McMillan, F. R.. Philadelphia, Pa.
McMinn, T. J....New York City
McNaugher, D. W. Pittsburgh, Pa.
McNaughton, W. C.,
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McPike, M. J....Brooklyn, N. Y.
Mahoney, J. N....New York City
Manley, H., Jr.. Elmhurst, N. Y.
Manley, L. B....Philadelphia, Pa.
Mansfield, W. H....Troy, N. Y.
Marshall, R. A....New York City
Martin, B. C.....Hudson, N. Y.
Marx, C. D.....Palo Alto, Cal.
Mason, F.....New York City
Masury, A. F....New York City
Matlaw, I. S.....New York City
Mattimore, H. S....Albany, N. Y.
Mead, C. A. Upper Montclair, N. J.
Meadowcroft, W.. New York City
Mebus, C. F....Philadelphia, Pa.
Meeker, R. A....Plainfield, N. J.
Meem, J. C.....Brooklyn, N. Y.
Meggy, R. L. G....Fanwood, N. J.
Mehren, E. J....New York City
Melius, L. L.....New York City
Melick, N. A.....Newark, N. J.
Merriman, M.....New York City
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Metcalf, L.....Boston, Mass.
Milholland, C. V.. Baltimore, Md.
Miller, A. B....New York City
Miller, C.....Richmond, Va.
Miller, H....New London, Conn.
Miller, H. A.....Boston, Mass.
Miller, M. M.....Yonkers, N. Y.
Miller, M. S.....Brooklyn, N. Y.
Miller, R. P.....New York City
Miller, S.....New York City
Miller, S. F.. South Orange, N. J.
Minor, E. E....New Haven, Conn.
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Modjeski, Ralph... New York City
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Molina, V.....New York City
Mönniche, T. B.....Roanoke, Va.
Moore, C. H.....New York City
Moore, E. J.....New York City
Moore, F. C.....New York City
Moore, F. F....New York City
Moore, W. H... New Haven, Conn.

Morrill, G. P....Bridgeport, Conn. Parker, C. J.....New York City
Morrison, G.....Astoria, N. Y. Parker, J. L....Fayetteville, N. C.
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Morssen, C. M.,
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Moyer, A.....New York City Parsons, R. S.....New York City
Mozart, W. J..New Haven, Conn. Peabody, W. W..Providence, R. I.
Muller, G.....Brooklyn, N. Y. Peek, J. S.....New York City
Munoz, G. C....Washington, D. C. Peck, L. F.....Hartford, Conn.
Murphy, F. E..Washington, D. C. Pegram, G. H.....New York City
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Murphy, J. J.....New York City Pendlebury, E....Arlington, N. J.
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Nelson, F. B.....New York City Picken, M. W.....New York City
Nelson, J. W.....New York City Pickersgill, W. C.Philadelphia, Pa.
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Norris, W. H.....Portland, Me. Pond, H. B.....New York City
North, A. T.....New York City Pond, H. O.....New York City
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Porter, G. F.,
O'Brien, J. H....Harrisburg, Pa. Montreal, Que., Canada
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Odell, F. S..Port Chester, N. Y. Porter, J. M.....Easton, Pa.
Ogden, J. C.....New York City Post, A. J.....New York City
Okun, A. H.....New York City Post, C. L.....Chicago, Ill.
Oleri, F. J..West New York, N. J. Post, C. W.....Albany, N. Y.
O'Rourke, J. F...New York City Powers, C. V. V...New York City
Ott, S. J.....Rutherford, N. J. Preston, G. H...Bloomfield, N. J.
Owen, J.....Montclair, N. J. Preston, H. W.,
Oxholm, T. S., Elmira Heights, N. Y.
West New Brighton, N. Y. Price, F. O.....Brooklyn, N. Y.
Paaswell, G.....New York City Price, P. L....Hempstead, N. Y.
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Quinn, M. F.	New York City	Rumery, R. R.	New York City
Randall, F. A.	New York City	Ryan, M. H.	New York City
Rankin, E. S.	Newark, N. J.	Ryder, E. M. T.	Yonkers, N. Y.
Rapalje, de W.	Plainfield, N. J.	Sackett, R. L.	State College, Pa.
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Reid, H. A.	Warren, Ohio	Sanborn, F. B.	Boston, Mass.
Reimann, R.	Relay, Md.	Sanborn, J. F.	New York City
Reimer, A. A.	East Orange, N. J.	Sartz, J. P.	New York City
Renner, C. J.	New York City	Saville, C. M.	Hartford, Conn.
Reppert, C. M.	Philadelphia, Pa.	Sax, P. M.	Philadelphia, Pa.
Reynolds, E. G., Jr.	New Rochelle, N. Y.	Sayers, E. L.	Woodbury, N. J.
Reynolds, J. O.	Richmond Hill, N. Y.	Schneeweiss, A. E.	Paterson, N. J.
Rhett, A. H.	New York City	Schobinger, G.	Hog Island, Pa.
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Richardson, J. D.	New York City	Schurig, E. G.	New Haven, Conn.
Richardson, J. H.	New York City	Schusler, G. W.	Pittsburgh, Pa.
Richmond, J. P. W.	Yonkers, N. Y.	Schweizer, R., Jr.	Ridgefield Park, N. J.
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Rights, L. D.	New York City	Scott, W. V.	Flushing, N. Y.
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Ripley, J. W.	New York City	Seaver, C.	New York City
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Robbins, F. H.	New York City	Shaffer, I. O.	New York City
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Roberts, R. F.	New York City	Shaughnessy, C. S.	New York City
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Skinner, F. F....New York City Stilson, C. E.....Detroit, Mich.
Skinner, F. W....New York City Stone, W. W....Metuchen, N. J.
Slater, W. A....Philadelphia, Pa. Stowe, H. C.....Brooklyn, N. Y.
Sloan, S. A....Philadelphia, Pa. Stowitts, G. P....New York City
Sloan, W. G.....Nutley, N. J. Strachan, J.....Brooklyn, N. Y.
Slocum, H. S....New York City Strickler, G. B....Washington, D. C.
Small, J. H., Jr....Richmond, Va. Strobel, C. L.....Chicago, Ill.
Smith, A.....Bayonne, N. J. Strong, J. B.....New York City
Smith, C. E....Washington, D. C. Strouse, W. F....Baltimore, Md.
Smith, E. M.....New York City Stuart, J. T.....Philadelphia, Pa.
Smith, E. N.....Nutley, N. J. Sturdevant, J. H.,
Smith, E. U....Philadelphia, Pa. Poughkeepsie, N. Y.
Smith, H....South Amboy, N. J. Sutton, C. W.....New York City
Smith, H. H.....Brooklyn, N. Y. Swensson, O. J....Philadelphia, Pa.
Smith, H. S....Wilkes-Barre, Pa. Swezey, E. C.,
Smith, J. R.....Bethlehem, Pa. Clinton Corners, N. Y.
Smith, J. W....New York City Swindells, J. S....Brooklyn, N. Y.
Smith, W. F....Philadelphia, Pa.
Smoley, C. K....Scranton, Pa. Taft, J. R.....New York City
Smoyer, L. I....Woodhaven, N. Y. Talbot, A. N.....Urbana, Ill.
Snell, E. B....New Haven, Conn. Talbot, E.....Englewood, N. J.
Snell, T. C. B....New York City Tallman, L.....Brooklyn, N. Y.
Snow, J. B....Forest Hills, N. Y. Taussig, J. W.....New York City
Solomon, G. R.....Atlanta, Ga. Taylor, C. F.....New York City
Spencer, W. T....Boston, Mass. Taylor, G. B....New Britain, Conn.
Sperry, H. M.....New York City Taylor, W. G.....Newark, N. J.
Splitstone, C. H.,
 East Orange, N. J. Terry, A. H....Bridgeport, Conn.
Spofford, C. M....Boston, Mass. Thomes, E. H....Jamaica, N. Y.
Sprague, E. L., Jr.,
 Maplewood, N. J. Thompson, S. C....New York City
Stark, C. W....New York City Thompson, S. E....Boston, Mass.
Starr, H. H....Philadelphia, Pa. Thompson, W. G. B....Trenton, N. J.
Stearns, E. B....New York City Thomson, T. K....New York City
Stearns, F. P....Boston, Mass. Thorn, H. B.....New York City
Stearns, R. H....Washington, D. C. Tidd, A. W....White Plains, N. Y.
Stehle, F. C.....Towanda, Pa. Tighe, J. L.....Holyoke, Mass.
Stengel, C. H....New York City Tilden, C. J....Baltimore, Md.
 Tomkins, C.....New York City
 Tomlinson, C. P....Hartford, Conn.

Tompkins, C. H. Washington, D. C. Waite, G. B. New York City
Tooker, F. W. East Orange, N. J. Waldron, S. P. Boston, Mass.
Torrey, J. E. Paterson, N. J. Walker, C. I. New York City
Tower, J. W. New York City Walker, I. S. New York City
Townsend, F. T. New York City Walker, J. J. Dobbs Ferry, N. Y.
Townsend, T. M., Wall, E. E. St. Louis, Mo.
Schenectady, N. Y.
Tozzer, A. C. New York City Wallace, J. F. New York City
Tresise, F. J. Buffalo, N. Y. Ward, E. A. Newark, N. J.
Tretter, G. A. Roanoke, Va. Wasser, T. J. Jersey City, N. J.
Tribus, L. L. New York City Waters, W. L. New York City
Triest, W. G. New York City Watson, C. H., Great Neck Station, N. Y.
Trimpi, A. L. East Orange, N. J.
Trout, C. E.,
West New Brighton, N. Y.
Trow, F. H. Kingston, N. Y.
Tull, R. W. New York City Webster, A. L. New York City
Tuska, G. R. Washington, D. C. Webster, G. S. Philadelphia, Pa.
Tuttle, A. S. New York City Weed, L. W. Philadelphia, Pa.
Uhl, W. F. Boston, Mass. Wegmann, E. Yonkers, N. Y.
Underwood, H. W., Weitzner, H. M. New York City
Philadelphia, Pa. Weldin, W. A. Pittsburgh, Pa.
Ungrich, M. J. New York City Welty, H. T. New York City
Upton, J. Flushing, N. Y. Wendt, E. F. Washington, D. C.
Weymouth, A. New York City Wheeler, R. C. Newport News, Va.
Whinery, S. New York City Whitcraft, L. N. Hackensack, N. J.
Vail, E. M. Plainfield, N. J. White, B. E. Utica, N. Y.
Vail, J. J. Rahway, N. J. White, L. New York City
Van Alstyne, H. A. New York City White, T. S. Beaver Falls, Pa.
Van Cleve, A. H. Buffalo, N. Y. White, W. M. New York City
Van Horne, J. G. New York City Whited, W. Harrisburg, Pa.
Van Norden, E. M. New York City Whitney, A. R. New York City
Vincent, J. I. New York City Whitney, G. C. Brooklyn, N. Y.
Vogel, J. L. Jersey City, N. J. Whitson, A. U. Flushing, N. Y.
Vogleson, J. A. Philadelphia, Pa. Wickham, H. R. Brooklyn, N. Y.
Voynow, C. B. Philadelphia, Pa. Widdicombe, S. H. New York City
Wadsworth, J. E. New York City Wiggin, E. W. New Haven, Conn.
Wagner, H. E. Brooklyn, N. Y. Wigley, C. G. New York City
Wagner, S. T. Philadelphia, Pa. Wilcock, F. Brooklyn, N. Y.
Wahlman, P. New York City Wiley, W. H. New York City
Wait, B. H. New York City Wilkerson, T. J. Beaver Falls, Pa.
Waite, D. C. Brooklyn, N. Y. Wilkes, J. Nashville, Tenn.
Wilkins, W. G. Pittsburgh, Pa.

Williams, C. G....Plainfield, N. J. Wolff, A. D., Jr....Hudson, N. Y.
Williams, F. P.....Albany, N. Y. Wolff, H. H.....Denver, Colo.
Williams, G. S..Ann Arbor, Mich. Wolff, R. B.....New York City
Williams, J. P. J..New York City Wood, G. P.....Peekskill, N. Y.
Williams, M. W...New York City Woodcock, H. W...Brooklyn, N. Y.
Willoughby, J. E., Wright, F. H.....Brooklyn, N. Y.
Wilmington, N. C. Wyckoff, C. R....Hartsdale, N. Y.
Wilmot, S.....Providence, R. I. Wyman, A. M...Philadelphia, Pa.
Wilson, C. W. S.,

New Rochelle, N. Y. Yates, E. A....Perth Amboy, N. J.
Wilson, W. T.....New York City Yates, J. J.....New York City
Wilson, W. W.....Bridgeport, Pa. Yates, P. K.....New York City
Winsor, F. E....Providence, R. I. Yates, S. S.....Englewood, N. J.
Winsor, G. A..Pleasantville, N. Y. Yates, W. H.....New York City
Winsor, H. D.....New York City Yereance, W. B....New York City
Wise, C. R.....Passaic, N. J. Young, C. G.....New York City
Wise, R. S.....Passaic, N. J. Young, H. A.....New York City
Witmer, F. P.....Brooklyn, N. Y.

GOVERNMENT WAR CONSTRUCTION WORK IN THE UNITED STATES

AN ADDRESS BY BRIG.-GEN. R. C. MARSHALL, JR.,
CHIEF OF CONSTRUCTION DIVISION, U. S. A.,
AT THE ANNUAL MEETING, JANUARY 15TH, 1919.

Permit me to assure you, in beginning, of my sincere appreciation of the compliment which has been extended to me by the American Society of Civil Engineers in the invitation to address its members gathered here at this meeting. It is probable that this is the most important meeting of the Society which has ever been held. Engineering problems encountered and overcome within the past year of unprecedented activity—unprecedented both in volume of work and in conditions under which it had to be accomplished—and problems which will face this Society, as well as every other constructive organization of Americans, involving the renewed activities of peace and commerce, are matters for its most sober and intelligent consideration. I feel that I may properly talk to you as a brother in interest by reason of the fact that the Construction Division numbers in its membership so many members of the American Society of Civil Engineers, and I have been necessarily intimately in contact with them and with the many problems that they have had.

Of the detailed technical side of these matters I cannot hope to be of informative value to this audience, and I have no ambition to attempt the "transportation of coals to Newcastle." The work of construction for the War Department, carried on during the period of the war by the Construction Division of the Army, with which I have been intimately associated, and the experience which has been mine during the time of its accomplishment will, however, I am constrained to believe, be of some value, at least, in opening a field for thought and for subsequent action.

Briefly outlining what the Construction Division is, and what it has done, it may be stated that it is a Bureau of the War Department charged with the entire construction work of and for the Army, in this country, in the Hawaiian Islands, the Philippine Islands, Alaska, Porto Rico, and the Canal Zone. It has done all this construction work, including the camps for the accommodation of the first increments of the tremendous Army called into being under the Selective Service Act and the federalization of the National Guard.

The magnitude of the undertaking cannot be over-emphasized when it is considered that the sites for these camps were not selected until the period from June 6th to June 17th, and it was proposed to call the first contingent of conscripted men to camp during the first week of

September. Hence, there remained only about 90 days in which to complete the plans in Washington for general arrangements, prepare specifications and contracts, select the contractors, organize field forces for the contractor, Constructing Quartermaster, Supervising Engineer, and Auditing Division, as well as to build at each of sixteen sites a cantonment estimated to cost, roughly, \$6 000 000, to house about 40 000 people and about 10 000 animals.

In a little more than 3 months the Cantonment Division was expected to have suitable quarters ready for the training of more than 1 000 000 men. In the construction of the camps, it was proposed to build, in an entirely undeveloped tract of land, a site capable of housing, on an average, 40 000 persons. This site was to be complete, with housing, railroad tracks, roads, and all the various utilities. A group of engineering problems of first importance had to be solved: the water supply for each camp studied; proper sewerage provided; heating, lighting, refrigerating, and laundry facilities furnished. The solution of these engineering problems was different in every locality. The planning alone, for construction work of each of the camps, would normally take as many weeks as was given for the completion of both the engineering and the building. It was necessary that the planning, engineering, and building go forward together.

In each camp, the building, aside from the engineering problems, was a huge operation. Each cantonment required millions of feet of lumber; and several thousand carloads of construction freight had to be handled in each yard. Many of the cantonments and camps were at places served by one track only. Extra railroad facilities had to be provided for handling the materials necessary for the construction of the camps. Labor had to be imported from a distance, in many instances, as many of the cantonments and camps were at points remote from labor markets. The problem of organizing the men into efficient construction forces was very great.

The prevention of the epidemics and diseases incident to the housing of troops is dependent on the engineering skill of design and its subsequent execution. In the cantonments and camps in this country the exact proof that these were of the highest order is that there has not been a single epidemic or, indeed, so far as is directly traceable, a single case of water-borne disease or disease due to insanitation. As a further illustration of this, I quote from *Engineering News-Record* of August 29th, 1918:

"Combined reports for the American armies at home and abroad showed a death rate from disease of 1.9 per 1 000 per annum for the week ended July 26, based on a total of 2 500 000 men. For the past two months the rate was 2.8. The rate for men of military age in civil life is 6.7. Records for earlier wars, according to the office of the Surgeon General, were: Mexican, 100; Civil, 40 in 1862 and 60 in

1863; Spanish-American, 25; Russo-Japanese (for Japanese troops), 20. (It should be noted that the civil rate and the earlier war rates are for long periods.)

In addition, the Division has constructed, speaking generally, arsenals, wharves, docks, and forts, tremendous port terminals, reserve storage warehouses, hospitals of all sizes and descriptions, aviation fields, proving grounds, embarkation camps, engineer camps, gunnery schools, powder plants, factories, and additions to manufacturing plants, and plants for the construction of munitions, including special new plants for the manufacture of acids, gases, nitrates, phosphorus, T.N.T., and other explosives, with incidental work in the nature of housing and light-erage construction connected with the above. The magnitude of the task involved is indicated by the fact that during the past 16 months the cost of the work on which the Construction Division has been engaged has exceeded \$800 000 000—\$50 000 000 per month—and has involved more than 500 jobs scattered all over this country, in fact, in every State but one.

If the average American were asked to name the greatest engineering and construction feat of this age, he would most certainly mention the Panama Canal. In the construction of this canal the expenditures never exceeded \$50 000 000 a year, and the total cost was approximately \$375 000 000, covering a period of 10 years. The entire work, in its greatest length, from end to end, was 50 miles.

From a construction programme as gigantic and as diversified as the Army building activities, in the past year and a half, it is inevitable that thoughtful men may draw many lessons in many fields: the high pressure under which the work had to be done, the urgent and absolute necessity for almost frantic speed in the completion of every project, and the consequent differences in the manner of procedure, have demonstrated that many things hitherto thought impossible are on the contrary highly advisable, and many things hitherto universally accepted almost as axioms are neither true nor to the interest of efficiency or economy.

Let me advert to the form of contract which the Construction Division has used. Popularly, it is almost universally known as a "Cost-Plus Contract", but, strictly speaking, this term is not exact. The contract which has been used from the beginning, with slight modifications in non-essential details, has been one in which the contractor was reimbursed his actual expenditures with a fee to him graduated on a sliding scale. The percentage he receives gets lower as the cost increases, and a maximum figure is set which his fee can, in no case, exceed, no matter what the cost of the work may be. Many reasons dictated the adoption of this form of contract which, to all who understand the facts, has proved its usefulness and its value beyond the peradventure of a doubt.

Take for a moment's consideration the conditions under which the original camps were built. The Cantonment Division (which later was enlarged and developed into the present Construction Division) was told that in 90 days it must complete the following work: It must have quarters ready for the training of more than 1 000 000 men; it must go upon thirty-two virgin sites and on each one build a camp, equipped in all essential details, to house and accommodate a draft army about to be called to the colors. It must draw, co-ordinate, and complete the plans, prepare specifications and contracts, select the contractors, organize field forces for them, appoint Constructing Quartermasters, Supervising Engineers, and attending organizations. It must see that material in immense quantities was forthcoming; it must foresee and solve the engineering problems involved, and it must build sixteen cantonments, roughly estimated to cost \$6 000 000, each to house 40 000 people, and sixteen tent camps, at about half the cost of the cantonments, but to accommodate almost as many men. Rough building was not sufficient—roads must be laid out, water supply and sewerage problems developed and overcome, and the result must be, so far as public utilities are concerned, comparable, at least in efficient working ability, with those of a city of the same size; and all this in 90 days.

Could any other contract known to man, or which the ingenuity of man could devise, have taken care of this situation? The making of plans, the advising of engineering features, the procurement of material, the formation of the organization, and the building itself had all to go hand in hand. The markets for material and labor were in a period of instability, to an extraordinary degree, and no contractor on earth could have made an intelligent bid on any one of these projects, had he had plans and specifications on which to base it. Nor, conversely, could plans and specifications have been furnished him, had he been in a position to bid.

Let me not be misunderstood, the sole justification for the cost-plus contract, as used during the war, is not the uncertain and unstable condition brought about by the war, for the cost-plus contract, properly administered, is the proper, conservative, and just method of doing contracting work—just, alike to the owner, the engineer, and the contractor. In this connection I want to draw the attention of this audience to the trend of Congress in this matter, as indicated in two provisions of law. In the "Bill making appropriations for the support of the Army for the fiscal year ending June 30th, 1919," Public No. 193, 65th Congress, the following appears:

"Provided, That where practical so to do no work be done or contract made under or by authority of any provision of this Act on or under a percentage or cost-plus percentage basis, nor shall any contract, where circumstances so permit, be let involving more than \$1 000

until at least three responsible competing contractors shall have been notified and considered in connection with such contract and all contracts to be awarded to the lowest responsible bidder, the Government reserving the right to reject any and all bids".

Also, "An Act to Authorize the President to provide housing for war needs," Public No. 149, 65th Congress, Section 7, reads as follows:

"That no work to be done or contract to be made under or by authority of any provision of this Act shall be done or made on or under a percentage or cost-plus percentage basis, nor shall any contract be let until at least three responsible competing contractors shall have been notified and considered in connection with such contract, and all contracts to be awarded to the lowest responsible bidder, the Government reserving the right to reject any and all bids".

I cannot believe that this tendency of Congress has been brought about through any effort by this Society, or any similar to it. I am convinced that the best thoughts are quite to the contrary. I do believe that these laws, and similar talk in Congress, is brought about by the lack of effort on the part of this Society and similar ones.

Education, of course, is the only remedy worthy the name for ignorance or for mistaken apprehension of facts. Through ignorance and through mistaken apprehension of the facts of the case, the emergency contract outlined above has been the subject of bitter attack from persons in and out of the Government service and from quarters high and low. Let me add that, in my opinion, these attacks, in most cases, have been sincere, but due entirely to a mistaken apprehension of the nature of the causation of the actual operations and of the results of these contracts. They have saved—and this is demonstrable—to the Government a vast sum of money. They have operated with smoothness and flexibility, and with surprisingly little misunderstanding or friction between the Government and the many contractors in question. Without them the vast building programme of the Army, which has been successfully accomplished, would have been a matter of utter impossibility.

However, from the very fact that they have not been understood, that their nature is not clearly seen, and that the people in general, including National legislators, have not informed themselves concerning them, they are in bad odor in many quarters, and a more or less determined effort is being made to prohibit their further use. I trust it will not be presumptuous in me to say that I am satisfied that the remedy for this state of affairs is the education of Congress and of others who oppose this or other measures because they do not understand them, and this education should not come through the education of the people at large, and the consequent infiltration of the knowledge thus disseminated into the legislative brain; the process should be reversed. The men who make the Nation's laws should themselves

be informed of the truth, and, in matters such as this, it is the province of just such Societies as yours to act as the educational agency.

I say of Societies such as yours, because, to my mind, the future of the contracting industry and of the engineering societies is indissolubly linked together. The contractor cannot function without the engineer. The engineer cannot function without the contractor, and I use the term engineer in its broadest sense. The work of the Construction Division has demonstrated that the closest co-operation and co-ordination is an absolute prerequisite to successful accomplishment which has been attained under the most trying and disheartening conditions. Without that co-operation nothing could have been done.

This brings me to another thought which I wish to urge for earnest consideration by this audience. It is my belief that the dignity, the power, the learning, and the history of accomplishment of the engineers of this country make them a factor in its future undertakings which must in time be realized and accepted by the Government. They should be gratefully and heartily accepted by the Government as a constructive force and as an instrument of accomplishment which, properly taken advantage of, will be second to none; but, in order that the fullest good can come from such a consummation, there must be the utmost harmony, the utmost flexibility, and the most thorough co-operation among the engineers themselves.

Let me illustrate: In the building operations of the Construction Division, there has never been a time when the great engineering societies of this country have not been willing and eager to lend their assistance to the work of the Construction Division, each and every one of them, and I wish here and now to tender publicly my grateful and heartfelt thanks for this invaluable assistance extended so generously and so freely; but, in every case, the War Department had to treat with a number of more or less isolated societies, *e. g.*, the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and so forth. There are nineteen of them, I am told.

In union there is strength, and there is no axiom, of the many which are so freely mouthed, which is so true and so universal in its application as this one. Had there been amalgamation of these societies, a consolidation if you will, a central governing body to which they were all subsidiary, or in some shape or form a co-ordination, a central direction, some one head to which they all looked and with which an outside agency could treat, the task of the War Department would have been infinitely simplified. I believe that, for the greatest good of the engineers, of the Government, and of the economic life of this country, some such arrangement will have to be made. Concerning the form or the method, I do not know and would not presume to advise. Concerning the wisdom of such action, I am as sure as I am

of anything in the world, and I urge it upon you to consider it and to make it an accomplished fact as soon as may be.

The experience of this work has shown the infinite wisdom of a close rapport between governmental agencies and the large commercial and professional organizations whose aid must be enlisted at any time of National crisis. Such aid has been freely given during this war, but the method of effecting its greatest accomplishment has been hindered and hampered by the fact that, at first, the parties had to establish mutual understandings, to get each other's viewpoints, and to adjust themselves to a changed and unfamiliar method of accomplishing results. There should be in the future—there must be—close touch and sympathy between such organizations and the executive departments of the Government.

This, I hope, will be particularly the case with the membership of the Engineering Societies of America. Just what form legislation will take concerning military training and the formation of a reserve army, no man can at this moment say. It is inconceivable, however, to any thinking man that our state of National preparedness and our ability to take advantage of all existing agencies of protection, and to mobilize our men and resources for national defense, will ever again recede to the condition they were in when the present conflict was forced upon us. Some sort of reserve army is inevitable.

The tremendous construction undertakings of the Government, the facilities for arming, equipping, training, and supply of our soldiers will have to be kept up, at least in some measure. Building operations may be continued in some shape or form. In any event, and in whatever shape the ultimate result may be reached, the opportunity for the membership of the engineering societies to serve actively in the Government and to make both themselves and the powerful organizations which they represent of the greatest value to the nation is clear.

Without the membership of your Society embraced in the Reserve Corps, in the National Army, the men who threw aside all thought in themselves, their ambitions, and their undertakings, to offer the resources of their bodies and brains to their country, the results which were attained would have been impossible. Had these men in the beginning been trained to think along not only professional but military lines the results would have been even more astounding in their success.

Let me urge upon you men, whose services are of such an inestimable value and who have the urge of patriotism in your hearts, enroll yourselves in whatever reserve may be contemplated. By such a course of action and by intelligent interest in the army on the part of the individuals involved, two results should be attained. The liaison between the engineering societies and the Government should be

strengthened, and a reserve of trained and most invaluable soldiers will be at hand at any time of National emergency.

I have, as I promised in beginning, said little about the technical features of the work involved in the construction undertakings of the War Department. The technical journals have portrayed and will portray them at length and in detail, both as matters of general interest to the profession, and some few of controversial interest which, by process of discussion, investigation, and experimentation, must inevitably result in great strides in accomplishment. In the diversified construction operations in which the Construction Division has been engaged, these problems have been faced in myriad forms. They have been solved in many ways.

The question of sewage disposal—one of the most vital and important which faces the municipal governments of this country—has been treated in a manner rather radically different from what obtained before the war. The use of wood-stave pipe in large water supply projects was adopted in the beginning as a necessity, from inability to obtain the necessary metal pipe, and has been developed and perfected. The work on the tremendous interior storage depots and the great terminals and ports of embarkation, involving construction of the most permanent character, has brought forward many most interesting situations. The conditions of the work, and the necessity for continuing in all weathers and in all seasons, have produced in many instances new methods of going about the work and new records of accomplishment.

With these matters, I am sure, this audience is already thoroughly familiar, and in a talk such as this, I feel, is not the time or the occasion to amplify them in detail. I have, however, brought with me some lantern slides to attempt to give some conception of the magnitude and the character of the work in which I and so many others have been engaged, and these will incidentally contain, I hope, some points of interest from a professional standpoint.

(Gen. Marshall showed a number of lantern slides illustrating the work of the Government in the United States during the war.)

In conclusion, I desire to thank you again for this opportunity and for the attention which you have given to my remarks. I have endeavored only to convey to you the facts which my experience of the past eighteen months has impressed upon my mind and heart, and to indicate what I believe to be courses which should be pursued, and which, in my opinion, will be far-reaching and of tremendous importance in their beneficial results. You realize, of course, that I am speaking to you not as an engineer, but as a soldier; but if, by reason of the duties to which I have been assigned, my experience will ever be of benefit, or my advice can ever be thought of importance, I offer it as freely and as heartily as the offers which have been made by your Society and so gratefully accepted by the War Department.

ITEMS OF INTEREST**Informal Addresses by the Delegates****of the Four Founder Societies**

**to the Joint Engineering Congress, held in Paris
in December, 1918.**

February 10th, 1919.—A Joint Meeting of the Four Founder Societies, called for the purpose of hearing informal addresses by their delegates to the Joint Engineering Congress in Paris, was called to order at 8.30 p. m.; Col. Herbert S. Crocker, Vice-President, Am. Soc. C. E., in the chair; T. J. McMinn, M. Am. Soc. C. E., acting as Secretary; and present, also, about 500 members and guests.

The following statement, prepared by the Secretary, was read:

In October last, Maj. J. F. Case, M. Am. Soc. C. E.—who not long before that had returned from France—reported verbally that the French Engineers were extremely desirous of having a Delegation of American Engineers present at the Engineering Congress to be held in December, 1918, and subsequently the matter was brought to the attention of the Executive Committee of the Board of Direction of the American Society of Civil Engineers. After an exchange of cables, this Society accepted the invitation of the French Engineers, which was forwarded with the approval of the French Ministries of Public Works, of Commerce, and of Armament, to form a delegation of engineers to attend a Joint Engineering Congress for formulating plans for the restoration and development of French industry, with the co-operation of the other three Founder Societies.

Inasmuch as the Congress was to be held about the middle of December, there was necessity for great haste. Engineers had to be selected whose specialties covered points in reconstruction and development work which the Congress had especially laid down for discussion. At the same time it was necessary that these engineers should be prepared to sail almost immediately.

The difficulty of securing passports, for which personal application must be made, and of securing accommodations for the voyage, all tended to make it necessary to act very promptly. The other three Societies were communicated with, with the result that E. Gybon Spilsbury was appointed to represent the American Institute of Mining Engineers, President Charles T. Main of the American Society of Mechanical Engineers was appointed to represent that Society, and Lewis B. Stillwell was appointed as the representative of the American Institute of Electrical Engineers.

The subjects to be considered by the Congress were largely in the line of Civil Engineering work, and the representatives of the Civil Engineers selected were: Maj. J. F. Case, who was selected as Chairman of the Delegation, George W. Fuller, A. M. Hunt, Nelson P. Lewis, George F. Swain, and George W. Tillson.

Accommodations for the voyage were reserved even before the Delegation was appointed, and, after numerous difficulties, among which might be mentioned the fact that the application for passports was refused at first by the State Department, the Delegation sailed for

France on December 5th, 1918. Since that time no official word has been received from the Delegation, and this meeting has been arranged to hear from them in a more or less informal manner what they saw and what they accomplished, pending the receipt of a formal report of their activities, which will be presented to the four Societies which the Delegation represents.

I think it might be well to state that although there has been no fault found with the action in accepting the invitation of the French Engineers, and no objection to the personnel of the Delegation chosen has been made, there has been the criticism that the choice was confined to engineers living in New York and Boston. It is apparent, however, that it would have been impossible to consult with qualified engineers living at a long distance from this port, and to have succeeded in making up a satisfactory Delegation on the basis of geographical distribution within the time at the disposal of the governing bodies of the Societies.

THE CHAIRMAN.—I shall waste no time in elaborate introduction of the speakers, because they do not require it. Maj. Case is still in France; Mr. Main is unable to be with us to-night on account of an important engagement in Boston. We will first hear from Dr. George F. Swain, who will speak on Technical Education and Waterways.

GEORGE F. SWAIN, PAST-PRESIDENT, AM. SOC. C. E.—Mr. President and members of the Engineering Societies, I shall not confine myself wholly to those topics which the Presiding Officer has mentioned. Probably the only reason for asking me to speak first is that I happen at the present time to be the Chairman of the delegation, as Maj. Case did not come back with us.

In March, 1918, there was held a Congress of engineers in France, and this Congress is still in existence. It was gotten up and carried on by business men, manufacturers, public men, and engineers, to deal with problems of engineering. The Chairman was M. Millerand, who was Minister of War at the beginning of the war. One meeting of the Congress was presided over by M. Clementel, Minister of Commerce.

They wanted to consult with American engineers on engineering problems of reconstruction. This does not mean the building up of the destroyed districts. Reconstruction has three stages in France: first, the conversion of industries from a war to a peace basis; the changing over of the factories that have been making shells, so that they can make automobiles or some other product.

Then, second, would come the rebuilding of the devastated districts; and, third, would come the great engineering problems which face France. It was with the last of these problems that this commission had to do. We had nothing to do with the actual changing over of industries or with building up the devastated regions, but were consulted with reference to the larger problems.

This Congress was divided into committees, and the committees were on ports, navigable waterways, roads, agriculture, rural sanitation

and hygiene, water power, and technical education. Those are all great problems which confront France.

We had the privilege of spending a month in France. We arrived on December 16th, and sailed on January 18th. We went straight to Paris, and there had meetings with the various committees of the Congress; we met the Chairmen and the engineers connected with those committees, and discussed the problems with them. They asked us questions; we answered them if we could. We have still several reports to prepare and send back to them.

We were treated with the greatest kindness and courtesy, in every possible way. They arranged excursions for us. They took us first to Nantes and St. Nazaire, where we spent two days. We saw what the American engineers had done, and what the French had done.

Later, we went to Southern France, going first to Grenoble, in the region of the Alps, where there are very great water powers, many of them developed, many more undeveloped. From Grenoble we went to Marseilles, and saw the port works there, the great tunnels and canals, that the French are building.

Coming back we spent two days at Lyons; we visited their industries, some water-power works, and so forth; and then back to Paris, where we had some further meetings of the Congress and the Committees.

Coming home we spent two days at Bordeaux where we saw the port works. We were entertained most hospitably wherever we went. We were entertained by Chambers of Commerce at Nantes, St. Nazaire, Bordeaux, Grenoble, Marseilles, and Lyons. We had the privilege of meeting a number of the ministers of the cabinet in France. We met M. Clementel, M. Loucheur, Minister of Reconstruction, and M. Pichon, Minister of Agriculture. We were received by Marshal Joffre, and met many of the other leading men of France.

The railroad companies treated us in a manner very surprising. When we went to Nantes and St. Nazaire, we had a private sleeping car, which waited there and brought us back. When we went to Lyons, a private car was placed at our disposal for a week. It was the same at Grenoble; the car waited for us and brought us back to Lyons and then to Paris.

I assure you, gentlemen, that traveling in France is not either pleasant or comfortable at present, if you have to travel in the ordinary way, as anybody who has been there can testify. With our private car we were very comfortable; and our thanks have been duly acknowledged to the railway companies, and to all the other parties who contributed to our pleasure and the profit of our trip. We think that something has been accomplished.

The French engineers are very anxious to co-operate with American engineers. They want to get American capital for France, and to learn American methods of work. They are very much surprised,

I think, by the work that American engineers have done there; and they think that possibly by co-operating in the future, both countries will be benefited. I thoroughly believe that such is the case.

At the last meeting of the Congress, M. Millerand was very earnest in urging that a permanent Franco-American International Committee should be appointed. We should keep in touch with each other, and by this means French engineers could inquire of American engineers and American engineers could inquire of French engineers, and get information. The Congress voted at its last meeting in favor of the appointment of such a committee, and appointed as the French members the Chairmen of all the various committees with whom we had been dealing—the very men with whom we had been in contact for a month in France.

They asked us to serve as the American members of the permanent committee; but we very properly declined, saying that we were simply appointed as delegates by our four National Engineering Societies, and that all we could do was to come home and report, and we have submitted a report to them stating these facts.

Before leaving France we presented a preliminary report to the French engineers. This report answered questions they had asked, and expressed our views on the various resolutions which had been passed at the first meeting of the Congress in March last, all of which we had in our possession before we left here.

We are now preparing a report, which will be submitted to the four National Engineering Societies, describing our work in detail.

France has done more than any other country in Europe toward developing a system of internal waterways. It has spent about \$360 000 000. All the works are owned and maintained by the Government. It has assumed the debt, pays the interest thereon, and maintains the works.

Any man may buy and operate a boat on a canal. When one pays for canal transportation, one simply pays the boatman his charge, but does not pay any interest on the first cost or any cost of maintenance. Manifestly, under those circumstances, you cannot compare properly the rates for water and rail transportation, because the railroads are in a very different situation.

The railroads are dominated by the Government and one of the seven railroad systems of France is actually owned by the State.

Now, the French have great plans for internal navigation. They must develop their ports, if they are going to take care of the traffic which formerly went to North Sea ports, to Bremen and Hamburg, and which they hope will hereafter go through France. The French have been planning very great works of improvement for their ports, but, of course, they have to provide the transportation inland from them, and that can be either by rail or by waterway.

They seem to have a great idea of developing waterways. That was the only point, I think, in which the members of the delegation were not—and certainly I myself was not quite—in sympathy with the French engineers. We saw plans for spending large sums of money in building canals and making rivers navigable, but we saw not one study of the economies of any of those questions; no statistics of transportation, no study as to whether they could get any return on the expenditure.

They have, for instance, a scheme for spending \$200 000 000 for making the Rhône navigable up to Lake Geneva. Probably they could build a double-track railroad up there for less than would be required to make the Rhône navigable, and it would probably carry the traffic at much less expense.

We were surprised that, in the proceedings of the Congress, so little study was given to the subject of railroads, although they are undoubtedly the most important agency in the development of national prosperity.

The question of internal navigation by canals and navigable rivers above the ports will be discussed in detail in our formal report. The projects are very interesting, but in the present emergency it seems to me that we must regard the economic aspect of State expenditures more than ever before. All the nations of the world are poor. They have been spending immense sums of money for war purposes, and there has been an immense destruction of property. There has never been a time in the history of the world when it has been more desirable to go slowly and to scrutinize every expenditure, whether public or private, to see that sound economy is practiced.

One of our committees had to deal with technical education. Such education in France appears to have been very theoretical.

I think the French realize that, with them as with us, the events of the last few years ought to lead to changes in educational methods. One great thing is to have one nation learn from another; and the best time to learn is when a man is young. We emphasized at every opportunity the desirability of having Americans go to France to study and Frenchmen come to America to study.

Few people realize how many of the most eminent men in this country, especially men of science, have studied in Germany. I do not think that is going to be so in the future. I hope not.

Still, it is a great thing for a young man to go abroad. There is a great broadening influence in spending a few years in a foreign country, not only for the language, but for the generally broadening influence on a man's character, learning other people's methods and points of view, learning what they have to teach; and I hope a great many young Americans who want to go abroad to study will go to France.

In the past, however, France has not encouraged that. When I was a young man I wanted to go to France, and I tried to do so, but I was not encouraged at all by the French authorities. On the other hand, I could go to Germany, and could get admission to the German polytechnic school, without the slightest trouble, and they would be glad to have me, and I went.

We told the French they would have to change their point of view in that respect; they admitted that they would have to, and said they wanted to.

A man may go to a foreign country to study with some particular professor, and France certainly has most eminent men in every line. The equipment of their schools, however, as far as we observed, does not compare with what we can offer in some of our schools.

Their engineering schools are in the hearts of the cities, where they cannot grow; where they have no room for laboratories or any expansion. One of the ministers said they were going to appropriate large sums for technical education. I hope they will open their schools to foreign students without undue restriction, and that there will be in the future an interchange of our young men with their young men.

THE CHAIRMAN.—The second speaker is Mr. George W. Tillson, who will speak on the subject of Roads.

G. W. TILLSON, M. AM. SOC. C. E.—Mr. Chairman and Gentlemen: The French gave us certain subjects which they wished us to consider. One subject was "Roads," to which Mr. Lewis and myself were specially assigned.

I was considerably surprised at this, because I knew that the French, for many years, had had the reputation, and justly too, of having the best system of roads, probably, in the world, when you consider the whole country.

Our method of procedure over there, in general, was that our committees should meet with their committees on the same subject; and our Committee on Roads met the Committee on Roads of the Congress, which was headed by M. Heude, formerly Inspector General of the "Ponts et Chaussées". The French understood from the severe traffic during the war that their old roads would not stand up under that which was to come, and also that, owing to the lack of attention given them during the war, there was a great deal of work to be done at this time.

As an instance of what has taken place in belligerent countries, I may say that the English Road Board has issued a statement that it is necessary now to expend about \$50 000 000, to put the important roads of Great Britain in the condition that they were in before the war.

The French realize, too, that motor traffic received a great impetus during the war, and they want to build roads that will stand such traffic as it will further develop. You know that the French, perhaps more

so than other people in Europe, build with the idea of permanence. They do not build as cheaply as we do. They have studied the work that has been done in other countries, particularly in road construction, and especially during the war period, to see what has been done by us. Their information has come principally from reports of road congresses, and what personal, individual information they have been able to obtain.

They are satisfied that the old method is going; they cannot use it any longer; and they presented us with a written summary of their views. They had come to the conclusion that the sprinkling, oiling, or tarring of roads was only a temporary expedient. Of course, we agreed with them in that. The types of road construction that seemed to appeal to them most were asphalt macadam by the penetration and mixing methods.

They were pretty well conversant with these types of construction, and they felt that the penetration method was the better for them, because it was cheaper than the mixing method, owing to the cost of the plant required for the latter.

The views of the French members of the Road Committee appeared to confirm the impression of Professor Swain, as to the lack of study of economic questions in these matters. They seemed to consider first cost more than ultimate cost, and because the mixing method cost more, seemed to dismiss that almost entirely from consideration.

The members of our committee urged the consideration of other types of roads, such as concrete and brick. We told them of the concrete roads which had been built in America during the past 10 years, and the good results that had been obtained, and that they could expect good results in France because their climate is more favorable, without the extremes of temperature which we have, and which cause cracks in the concrete.

We knew that in France they had large cement works and that they should be able to construct cement roads at reasonable cost. They told us that they had good stone for road construction, of whatever character they needed.

It seems that some years ago they had built in one part of France a concrete road which had not been a success, and for that reason they seemed to think it needed no further experiment. We told them that the first concrete roads in this country were not completely successful, but that they had improved very much as a result of experience in methods and with materials. They agreed in the final conclusions to recommend the use of cement concrete, where the materials were so convenient that it would be cheap.

As a matter of fact, we afterward saw in Grenoble quite a lot of cement concrete pavement that looked as if it had been down some years, and was in good condition.

As to brick, they dismissed that in their preliminary report, because they said that France was not a brick country. Although that is true of Southern France and the vicinity of Paris, where stone is used for buildings, bridges, and nearly all kinds of construction, when we went north, we found that brick was used almost exclusively, especially at Arras and Lens and in that section. Whether there are clays and shales that would make a good paving brick, of course, we do not know; but we told them that we thought it would pay them to experiment and find out if they could not produce paving brick which would prove as satisfactory as have those in this country.

We told them of the indifferent success first achieved here and of the subsequent improvement, until brick is now one of our standard paving materials. They finally joined in the conclusions to that effect.

Then came up the question of finance; not only how should the money be raised, but how it should be paid to the contractor; both of which questions were of considerable importance to them.

We described to them the method of special assessment so frequently used in America. The idea seemed to appeal to them, but they thought that under present conditions in France, and under existing laws, it would be hardly possible to adopt it, but that the better way to finance their road work was by state, departmental, and communal appropriations.

They asked us specifically, "Will American contractors come over here and do road work, and take their pay in 15 annual installments?" We told them, "Yes, but you must understand this: First, they must have absolute and positive arrangements made for the payments, as to which there must be no question; and, secondly, if you pay them in that way, you will pay 60 or 75% more for the work than you would if you paid when it was completed."

That did not seem to appeal to them. We pointed out that if they were to issue serial bonds, say for 15 years, and pay the contractor in full when the work was done, the interest and principal sum would be much less.

As an abstract proposition, that seemed to appeal to them. As a concrete proposition, they came back to the condition that that is not the way they do it in France; and the French are very conservative. When we suggested that if it were against the law they might change the law and so carry out the work in that way. They assured us that it is very difficult to change the laws of France.

One of the Members of the Congress told me, just before we left, that the Minister of Public Works had agreed to a large appropriation for this work, that they appreciate the fact that there is a vast quantity of this work to be done, and it should be done quickly, and that they wish to get as many people working as possible. We left with the

committee a complete set of standard specifications for the various types of road construction used in this country, and full information concerning the various methods of financing highway improvements in our urban and rural districts.

After we got through with the final discussions, we drew up a report, following closely the lines which I have indicated, which was submitted to and accepted by the General Congress. I think both Mr. Lewis and myself felt that we had done them some good, but we also felt, quite naturally, that if they had accepted more of our ideas, we would have done them a little more good.

THE CHAIRMAN.—We will now have the pleasure of hearing from Mr. E. G. Spilsbury on the Trip to Lens, and the Coal Mines.

E. GYBBON SPILSBURY, M. INST. MINING ENGRS.—Mr. President and Gentlemen: A visit to the battlefronts and the devastated region in the northwest of France is still a matter of some difficulty, and can only be undertaken with the permission and under the auspices of the French Government.

We were specially favored as guests of the Government, and had attached to our party a Captain of the French Army, who had been engaged on that front during the war, and who made a splendid guide.

The Government also detailed Col. Cuvelet, the Chief Mining Engineer of the Lens Coal Mining District, to accompany us, and give us all possible information about the mines. The Chief Engineer of the Northern Railroad of France was also deputed, to take charge of our transportation.

The first stage of our trip was by rail to Arras, where we had our first sight of what war devastation means. The railroad station and the steel train sheds are a complete wreck. Our train was one of the first through trains to Brussels, which place it was expected to reach in 14 hours. The train preceding ours required 25 hours for the trip, which usually was made in 6 hours. I was informed that the Northern Railroad has 320 bridges to rebuild on its system alone. The army cars which had been ordered to meet us at Arras were delayed, and this enabled us to go through the town and see the damage which had been done.

The Cathedral, which was one of the most beautiful in Europe, is a mere heap of ruins, with the exception of one part of the chancel. I was very glad to note a large placard in front of the ruins, warning the public against touching or removing any of the carvings, as the French Government had taken charge, and proposed to keep it as a monument of Hun savagery.

The main square around the Cathedral does not at first sight appear to have suffered entire destruction. The fronts of the houses are more or less intact, but on closer inspection it is evident that the Boches carried out their system of absolute destruction with every

possible refinement of devilish ingenuity. It most cases the beams were cut through so as to drop each floor with all its furniture into a heap of ruins. This certainly was not war.

From Arras we drove out to Lens by car, visiting the battlefields of Vimy Ridge on the way. The whole country is a man-made desert. Not a house, not a tree remains intact, and the surface of the ground itself has been literally shot to pieces. Field after field covered with shell holes so close together as to overlap in many cases. When we add to all this the hundreds of trenches covering the whole area like a huge spider's web, it soon becomes apparent that the work of restoration of the soil for cultivation is a matter of years or decades. The surface soil has everywhere been blown away, and nothing but the white chalk formation remains. Finally, after much floundering through mud holes, we crossed the remains of the Somme Canal and were in Lens, or rather the spot where Lens once stood.

Of the town itself and the sixty or more mining shafts, not a building or head-frame remains standing, everything is levelled with the ground. Yes, there is one eminence remaining, the pile of débris caused by the destruction of the Cathedral, up the sides of which one can climb and from the top obtain an unobstructed view of the whole area of devastation. Terrible as this is, however, it was the fate of war, and the destruction was caused by both the contending armies, but the destruction of the mines, with the view of preventing, or at least retarding, for years their future operation, and so crippling the whole of the French industrial life, is far worse than the mere razing of the houses.

In the Lens district, there were in all some sixty mines, large and small, but the main operations were carried on by the Société des Mines de Lens, who were operating eighteen shafts before the war. Sixteen of these shafts were models of modern mining appliances. The buildings were all stone or concrete and the head-frames were steel structures, around which were grouped the washeries and grading machinery, with massive steel and concrete storage bins, chutes, and loading devices.

Of all this nothing remains except tangled masses of broken and twisted steel. Not content with letting these structures take their chance of being wrecked by shell fire, the Huns went systematically to work and cut the steel supporting legs of the head-frames with acetylene torches, and then, attaching cables to heavy motor trucks, they pulled the whole structures over. Every hoisting and pumping machine was either dynamited or broken up with sledges, and every boiler shows signs of having been exploded from the inside, besides the shell perforations in some of the steam domes. The electric motors and generators were not destroyed, but were taken carefully away and presumably shipped to Germany. They next proceeded to flood the mines by cutting ditches to some of the shafts, and laying pipes to

the more distant ones, through which they turned the waters of the Somme Canal.

The attempts made to dynamite the shaft curbing were apparently not very effective, for, as far as can be ascertained, this damage does not appear to have reached below about 150 ft. Of course, what they may have done in the lower workings before abandoning their operations will only be found when the mines are pumped out.

The Société des Mines de Lens, as soon as they established the extent of their surface damage, immediately set to work and have placed orders in Switzerland and the south of France for an entire re-equipment. Their orders were placed at the close of 1917, and deliveries are expected to begin in March or April of this year.

As there will be little or no coal available until the mines are de-watered, they propose running their pumping machinery by electricity.

It is estimated that it will take 30 000 h. p. for a full year and a half for this de-watering. They have a small surface coal deposit about 12 miles from Lens, where they are now building a power station from which to run the pumps.

It is expected that coal mining in the upper seams will probably begin in about a year.

One of the great difficulties will be the clearing away of the wreckage, owing to the habit the Germans had of connecting pieces of structural material with mines or explosives. The whole place is also full of unexploded shells and grenades. Hardly a day passes but some one is injured by these explosions.

After leaving Lens we drove over to Bapaume, another of the devastated cities. The English forces are doing good work in clearing up around that section, using Chinese coolies and Assamese for the work. They are also rebuilding the roads in good fashion.

It was sundown before we left Bapaume and practically dark when we reached Albert, which is probably the worst destroyed city of its size on the whole front. The destruction is so great that even the streets are in places obliterated, and it took our drivers nearly an hour to find their way finally to the railroad tracks where our special cars were waiting for us; we finally reached Paris late in the evening.

There is one thing that I want to impress on you, and that is, that the French people are not lying down and waiting for the expected amounts that they will receive from Germany before starting to reconstruct the work upon these lands.

Another thing was very apparent to us, and that is that they are not seeking the help of any foreign engineers to aid in this work. They have plenty of talent of their own, and they are going to use it.

THE CHAIRMAN.—The subject of Agricultural Engineering and Sanitation will be discussed by Mr. George W. Fuller.

GEORGE W. FULLER, M. AM. SOC. C. E.—The return of peace means readjustment problems for all nations, but differing in kind and degree. To France, the close of the war means the development of commercial and industrial procedures so that the annual budget, including its various political subdivisions, may be increased to a sum 10 000 000 000 francs in excess of what it was before the war.

This is of the essence of the French problem of reconstruction.

The Engineering Congress convened at a time when transitional procedures following the armistice were scarcely under way. Transportation facilities in France were more severely strained than during the war, owing to the need of rationing the civilian populations of Belgium, Alsace, and Lorraine, as well as the armies of occupation along the Rhine. Rehabilitation programmes for the devastated area naturally were awaiting the determination of the Peace Conference, and general conditions were somewhat apathetic in consequence of the coming parliamentary elections.

A struggle for commercial supremacy must be prepared for by France. Generally speaking, it was the practical aspects of modernizing and expanding the commerce and industry of the country, rather than the technical details of engineering, which occupied the attention of the Congress.

Agriculture is one of the basic sources of wealth of the nation, and the agricultural section devoted much attention to discussion of improving banking facilities. Fortunately, French farm lands are mortgaged to only a relatively slight extent. Working capital is needed by the farmers, and this is true of long-term credits, which the French members of the Congress hope may be obtained by farm bonds secured by mortgaging co-operating groups of farms, with the bonds placed on the open market under Government supervision. Short-term loans to farmers and others are now limited to 90 days, which is too short for the agriculturist, who is also handicapped by antiquated procedures for obtaining chattel mortgages on unmovable property. The French members were interested in learning the details of procedures in America, as an aid to formulating an agricultural bank in France.

American customs as to handling meats in central slaughter houses, in conjunction with cold storage plants and refrigerator cars, could be adopted advantageously by the French. The same is true as regards the more general use of drying for the preservation of fruits. A new process of concentrating and sterilizing grape juice and cider was explained by the French, who pointed out the advantages of transporting the reduced volume of the product and the ability to dilute it and ferment it with selected cultures in accordance with the teachings of Pasteur.

Agricultural implements have disappeared from the devastated areas, and are greatly depleted throughout France. Munition factories

will be converted to the manufacture of some lines. The French had a great variety of pipes, of equipment, and of detailed parts thereof. Standardization has made practically no headway, as is necessary for quantity production. For some equipment the French would like to see Franco-American concerns established. This has its advantages and difficulties. Each proposition, from financial, commercial, and engineering standpoints, should be carefully investigated on its own merits.

The French are well informed on scientific agriculture, and such topics were discussed practically not at all. It was along the commercial lines that the French members desired to hear concerning American experiences.

Rural sanitation in France—as elsewhere—is largely a question of an effective campaign of education. The French members were interested to learn of steps taken in America to teach personal hygiene in the schools with the aid of instruction to the teachers at conventions held at frequent intervals. The same was true of steps taken by public health authorities to stimulate interest in sanitary matters on the part of health officers and residents of the rural districts.

Assistance can be rendered by Americans along these lines, although it is a slow task to change the views of a nation so strongly individualistic as is France. In reference to this, it is well to bear in mind that France is a nation of home owners. The law of primogeniture disappeared with the French Revolution, and at about the same time a law was adopted prohibiting the disinheritance of a child to the extent of more than 50% of its heritage. This has much to do with an appreciation of the character of the French soldier, who has been fighting for his home, small though it may be, and the conduct of which has conservatively followed the customs of earlier days.

THE CHAIRMAN.—The next topic on the programme is “Hydroelectric Development and the Grenoble Trip.” I am pleased to introduce Mr. L. B. Stillwell, representing the American Institute of Electrical Engineers.

L. B. STILLWELL, M. AM. INST. ELECTRICAL ENGRS.—Mr. Chairman and Gentlemen: The Water Power Committee appointed by the delegation of American Engineers was composed of Mr. Hunt, Dr. Swain, Mr. Main, and myself. The Chairman of the Water Power Committee of the Congress was M. Blanchet, chief administrator of one of the important French railways, and a man who is exceedingly well informed as to the general problems of water power development.

The Committee, after having held several sessions in Paris on December 19th and 20th, arrived in Grenoble on January 5th, and a long session was held in the afternoon of that day, during which several engineers explained and described the projects for the development of water power, particularly in the Valley of the Upper Rhône.

Following our return to Paris, another session of the Water Power Committee was held at which other projects were described, for the consideration and discussion of the General Committee.

The water power of France is found principally in three districts or regions: The region of the Alps, drained by the Rhône and its tributaries, and which is the most important; the region of the Pyrenees, in regard to which our information is far less complete, as we did not have time to visit that part of the country. This is said to be second in ultimate importance, although, by reason of the distance of that region from industrial centers, the utilization of power has thus far been very much less than in the region of the Rhône. Then quite recently the water powers of what is known as the central massif of France, the high land south of the Loire, and in central southern France, have been receiving considerable attention, and though the streams are not very large, and the head is less than in the Alps and the Pyrenees, the aggregate of power available is considerable, and its location is highly favorable.

The total horse-power of France, in round numbers, based on the estimate of French engineers as to what proportion of the power is, or will in the near future be, commercially developable, is from 5 000 000 to 6 000 000. I believe it would be safer to consider 4 500 000 h. p., as the total that may be commercially developed, and 9 000 000 h. p. as the total available for 6 months of the year.

The coal consumption in France in the average year immediately preceding the war was about 60 000 000—it was 62 000 000 tons in 1913. Of this total about two-thirds are produced by French mines and one-third is imported. The average price prior to the war was from \$5 to \$6 a ton. The judgment of the engineers with whom I talked was that a considerable number of years would elapse, following the termination of the war, before the price of coal will be below \$8 a ton. It is obvious, therefore, that there exists an extremely practical and cogent reason for the prompt development of French water powers as a substitute for the use of coal. Beyond that, of course, the French, who are never lacking in vision, realize the tremendous effect, on the wealth of the country, of industrial development dependent on power.

In the United States, as you know, the figure before the war representing the output of our industries was about \$1 500 per h. p. used by American mills and factories. If you could utilize even one-half the water powers of France, the immense value of the factories and mills which could be supplied with that power can be easily imagined, and the number of operatives required by these mills, according to the figures prevailing in the United States would approximate 500 000.

The vicinity of Grenoble is the heart of the present water power development of France. Our delegation was divided into two parties, one party ascending the Valley of the Isere, while the other explored

the Valley of the Romanche. In the Valley of the Isere there is much of historic interest to the hydraulic engineer. The little town of Lancey, not far from Grenoble, is the birthplace of the utilization of hydraulic power under high heads in France.

In 1868 a young man solved the problem of utilizing the water power of the stream under a head of 200 m. There was a small mill there which was utilizing about 4 m., but he realized that if he could only produce the right kind of a wheel he could multiply that power enormously by taking the greater head, and in one year he succeeded in producing a wheel which, for the time, was certainly a marvel, a wheel of special construction, which is now on exhibition in the museum at Lancey, which in its essential elements has been duplicated since and is still in operation.

It was also in the immediate vicinity of Grenoble that the early experiments of Deprez were made which developed the necessity of using high pressure in order to secure wide distribution of power, so that this particular section of the country is one of great interest.

The establishment of Aristide Berges, at Lancey, where the development I first spoke of was made, and the establishment of Fredet on the same stream farther up, were visited by the Committee. The establishment of Fredet is a plant that is thoroughly modern in respect to nearly all its elements. Originally a paper mill, it has been expanded under the stress of the war emergency, and is now making calcite carbide in large quantities. They have just completed a modern plant for the manufacture of cyanide.

We can teach the French practically nothing in the technique of the hydraulic art or the construction of factories. The only matters they may have to learn from us are those which rest on the fact that our experience has been on a somewhat broader scale; that our units are large; that the pressures we have adopted in some cases are higher, and therefore we have had the opportunity of testing our theory by practical experience, which thus far they have not had. It is in that respect only, I think, that they can derive ideas from us which may be useful to them in their programme, so far as power is concerned.

In the Romanche Valley there is a plant now under construction which will utilize in one step a fall of 1100 m., about 3600 ft. The diameter of the pipe is 18 in. That, I think, is a higher head than we have attempted as yet in the United States.

The other plant of special interest, about which Mr. Spilsbury can answer questions better than I can, is one near Grenoble where they are using an electrolytic process to make iron pipe by depositing iron on revolving drums. This gives, of course, a chemically pure iron, and where particularly light structures are concerned, it is said to have material advantages and to be not prohibitive in cost.

One thing that is notable over there in regard to their utilization of water powers is their tendency to take the industry to the water power. In the tributaries of the Rhône there are many plants; not many of them are large, but they are numerous, and the processes in electro-chemical work and metallurgical work are varied and extremely interesting. The ratio of installed capacity to the average low-water flow, is about 3.5, which indicates that they are in many cases using power for less than 12 months in the year, and find it advantageous to put in apparatus even where the water is not available all the time.

Apparently, they have not thus far given a great deal of attention to the combination of steam power with water power. There are considerable deposits of coal, but of very poor quality, in the immediate vicinity of water power.

In our preliminary report we called attention to the fact that the ultimate solution of their problem would probably be to connect some of their coal regions with their water powers, and utilize the steam plants to convert secondary power to primary power as the demand may grow.

We saw at Grenoble several of the sub-stations at which power was received by transmission from the Alps, and we were particularly interested in examining the famous Thury system, which has been in operation now for some 20 years. That plant, as you may remember, utilizes continuous current at a constant rate of about 130 amperes, the voltage varying from 40 000 to 65 000, depending on the load. The receiving apparatus consists of pairs of motors, each motor having a potential of 3 500 volts across its commutator, a number of these pairs being connected in series. At low loads the efficiency of the system must be far from satisfactory, but the plant has been constructed with very great care and skill, as shown by the fact that in all these years they have had only one fatal accident in handling their high potential.

I noted, however, on the same pole line which carries the direct current, that there are conductors for the alternating current system, and they are now using six conductors, two 3-wire circuits for alternating current at 45 000 volts, through which they are transmitting 15 000 kw. as compared with 10 000 kw. for the direct current, showing that, having tried the direct current, they have swung over to the alternating three-phase current, as generally used in America.

The Durance, a tributary of the Rhône, is a stream of highly variable flow, and the importance of its proposed development rests, not only on the possible output of power, but also on the fact that irrigation is greatly needed in the lower part of this water-shed. A very elaborate plan for the development of the Rhône for these several purposes was described to us.

As regards the electrification of railways, the French have not done a great deal, although they were among the first to apply electricity to railway operation. M. Sabouret, Chief Engineer of the Paris and Orleans Railway, read an admirable, brief paper describing the present condition of the electrification of the railways. I was interested to note that the history of the application of electricity to haulage in France illustrates in a striking way the old adage that "a prophet is not without honor, save in his own country". The electric locomotives for the operation of the Baltimore Tunnel of the Baltimore and Ohio Railroad were introduced about 1898, certainly prior to 1900. The French company sent engineers over here to examine the operation of the railroads, and they reported that the solution of the problem of the haulage of trains from the Austerlitz station to the Quay D'Orsay was perfectly clear, that the electric locomotive should be used, and since 1900 they have been operating trains between those two points in that way.

During later years, when the Pennsylvania Railroad was considering the electrification of its terminal in New York City, the Vice-President, knowing that Mr. Cassatt, the President, was in France, cabled him that the French were using electricity to haul trains on the Orleans Railway, and Mr. Cassatt examined it and reported back that the problem was solved.

Prior to the War, the French engineers were making careful study of the problems of electrifying the Midi Railway, and contemplated some elaborate tests. The War stopped all that, but they still have it in mind, and engineers representing three of the French railways expect to come here soon to see what we have been doing since they last examined the work in America. They do not expect to electrify their entire systems, of course, but there are certain sections of France, where the roads within reach of water powers, and other sections where the traffic is dense, which they think it will pay to electrify.

They have taken up one thing in France recently, as the result of the sessions of the Engineering Congress held in March, and that is they are making a serious effort to standardize frequency and potential. Hitherto they have used a great variety of potentials and a considerable variety of frequencies. The individuality of the French engineer leads him to have his plant different from that of "the other fellow", if possible, but they realize now that a continuation of this policy will be disastrous to any scheme of linking up the sources of power, as they will have to do one of these days, in order to have one unified system, fed from all available sources of power. Therefore, at the last session in March it was recommended that a frequency of 50 be adopted as the standard, a frequency of 25 being permitted for special cases.

They will have to carry the idea of standardization through, if they wish to get the costs of production down to a reasonable basis. They

carry the idea of individuality to an extreme that is astonishing to us. The small manufacturer who makes a lamp socket, for example, or the dealer who retails lamp sockets, will call on the manufacturer to make his a little different from others, on the theory that, having secured his original customers he can hold them, as they cannot get that particular type anywhere else. That practice does not tend to reduce costs. They realize this now, and they are going to make an effort to overcome the difficulty.

As regards the laws under which water powers are utilized, the French are in very much the same position as we are. They are seeking for a general law governing water power relations. The power developments heretofore have been made either under authorizations which are revocable or under special concessions which are not always easily obtained. They now have in the House of Deputies a bill to establish a general law of concessions under which it is hoped that capital will be attracted to the development of their water powers, as they have not heretofore been developed on a scale commensurate with their possibilities.

THE CHAIRMAN.—The next speaker is assigned a double duty, to speak for himself on the subject of "General Remarks Regarding Ports and the Marseilles Trip", and also say a few words for Mr. Charles T. Main, who is absent and was to speak on the subject of the "United States' Activities at Bordeaux and St. Nazaire". I will introduce Mr. A. M. Hunt.

A. M. HUNT, M. AM. SOC. C. E.—Owing to the absence of Major J. F. Case, who was Chairman of the Committee on Ports, I have been asked to comment on this subject.

The French authorities have distinctly in view an effort to make their ports serve, not only the needs of France, but to make them ports of entry for middle Europe. To accomplish this, they contemplate an east and west railroad line from one or more of their Atlantic ports, over which freight arriving at such ports can be expeditiously and economically carried across France to some point in Switzerland, for instance Basle, and from such point to destination.

An ambitious project is being talked of, which contemplates making St. Nazaire the port of entry, from which place a very easy grade up the Loire River and to Basle can be followed. By utilizing existing railway lines, this route could be established in a minimum of time.

The French engineers realize that if they are to capture this trade, which before the war went through German ports, they must act promptly. To this end, this project contemplates taking over the plant which our Army has been constructing near St. Nazaire to supplement the previously existing facilities at that port.

These old facilities, which consist of a wet basin, with locks, would be wholly inadequate for this project, for, even prior to the War, they

were fully engaged in handling the imports intended for French consumption which entered this port. The new facilities, constructed by our Army, include a very extensive system of warehouses, with tracks and yards. There was under construction, at the time the Armistice was signed, a large pile wharf, which was designed to afford berthing space for, I think, ten vessels. The approach from the shore to deep water was completed at the time of our visit, and work was being done on the pier head, which was to be extended so as to afford about half the number of berths originally planned.

The range of tides at the Atlantic ports of France is from 6 to 8 m., or 19 to 26 ft. For handling vessels and discharging them, the French engineers have in most cases limited themselves to wet basins with locks.

The necessity for prompt action, and the greatly reduced costs, have made them take a lively interest in the possibilities of the methods which our Army engineers have used, and it seems probable that these methods will be at least considered seriously in the future.

The French engineers requested a report on the subject, with data as to the handling methods at American ports having extreme ranges of tide, and such a report will be sent them by members of our delegation.

Our Committee made the following recommendation in our written report to the Congrès du Génie Civil:

"The Committee believes that the Congress would do well to study the methods in use in America for loading and unloading facilities alongside the wharves, even where there is a considerable range of tide, without the use of enclosed basins entered through locks. Experience in our ports and at Panama has demonstrated that locks are not necessary even when the range of tide is very considerable. If the docks are equipped with proper mechanical devices for loading and unloading it makes little difference whether the vessel stands high or low at the dock. The Committee will not attempt to fix the limit of tide above which locks should be used, but at some American ports they have not been found necessary with a range of tide of 6 or 7 m."

The French engineers also desired specific information regarding floating docks. Information as to our practice in this line is being secured and will be sent to them.

Both Nantes and Bordeaux, which are old established ports, are some distance from the sea, up rivers. As the draft of vessels has increased, they have found themselves handicapped by the limited depths of water in the river channels.

Nantes is about 30 miles up the Loire River. Its handicap has led to the establishment of a port practically at the mouth of the river, the port of St. Nazaire, which is growing rapidly. Nantes has tried to hold its own by deepening the river channel, but St. Nazaire is destined to become the port for vessels of the largest type.

We also visited Marseilles, which is the main French port of entry on the Mediterranean. Its harbor is essentially an artificial one, except for what is known as the old port, which dates back to the days of the old Greek pirates in the era before Christ. The main harbor consists of a series of inter-connected basins formed between the shore and a stone breakwater which parallels it. As the tidal range is small, locks are not used.

The French members of the Congress were very much interested in learning of our methods of port administration, whether by the State, the city, the railroad companies, or the steamship companies. A report on this subject was promised them.

We arrived in France at Bordeaux and left from the same port. It suffers from the same handicap as Nantes, being about 60 miles up the Gironde River.

Some port facilities exist lower down the river and at its mouth, and it seems probable that these will be developed for the use of the largest vessels. The range of tide here is also great.

Our Army has done much construction work at this port and in the vicinity of Bordeaux.

There is a very large supply station at St. Sulpice, only a few miles out of Bordeaux, which we visited, where there is a very extensive system of warehouses and yards. It was a main supply point, and carried supplies for a million men for two months, as I recall the figures given us.

Just outside of Bordeaux there is an institution through which we were shown by the American Officer who took us over the American works around Bordeaux. He called it the "Mill", and explained that it was for making new men out of old ones. Soldiers arriving at Bordeaux for shipment home, are received at this "mill", leave all their old equipment and clothes, are cleaned, examined by medical officers, receive a complete new outfit, and are ready for the trip home. They go in, in line, at one end, dirty and disreputable, and many of them infested, and, after being passed along the line for about one-quarter of a mile, come out self-respecting soldiers once more.

THE CHAIRMAN.—The final speaker is Mr. Nelson P. Lewis, and his general subject is "The Chateau-Thierry Trip and General Impressions of the Conditions in France".

NELSON P. LEWIS, M. AM. SOC. C. E.—I was asked to say something of the visit to the Marne Valley and Chateau-Thierry. It was a notable visit, on the one day of our stay when the sun shone, and on one of the two days when it did not rain. We saw the sun rise that morning, when well outside the limits of Paris, as we followed the direct road to Meaux, one of the main roads of France, the trees along which had been cut down in order that they might not furnish a target for hostile air raiders, but new trees have already been planted.

At Meaux we crossed the Marne and followed its "smiling valley" as far as Le Ferte, where we recrossed it and bore to the north and then to the east. Turning into a side road we soon saw the first evidences of destruction at the little hamlet of Lucy de Bocage.

The village and, of course, its church, were completely destroyed, and just beyond we passed a little graveyard containing seventy-five or one hundred of our boys, each mound having a wooden cross, with a disk on which were American colors.

Then over the hill, and down to the hamlet of Belleau, through the ruined chateau of which we wandered, and were cautioned not to pick up anything, as a number of accidents had occurred, through indiscreet visitors picking up hand grenades or other objects which had been wired to bombs, and the results were disastrous.

Then we followed the road through the Belleau Woods, well shot to pieces, past more cemeteries and more pathetic little graves, and down into Chateau-Thierry itself. There is something left of the town, and there are a good many people still living there. Having lunched at a little old-fashioned inn, we crossed the river over one of the new steel bridges built by our engineers, in place of the wrecked masonry arches, and followed up the valley of the Marne, passing through Gland, Jaulgonne and other villages almost completely wrecked. Leaving the river, we went north to Cierges and Sergy, which were completely wrecked, and then to Fère-en-Tardenois, which figured so largely in the war reports.

From there we followed the direct road to Soissons across a country less interesting than the Marne Valley, but passing great munition dumps, containing hundreds of thousands of shells which had been ready to be sent to the front on the light railways, but in the hurried departure were left behind.

Soissons must have been a very attractive town, more like one of our American cities than anything else we saw, with stately detached houses set in spacious grounds, but nearly all wrecked, none inhabited. Of course, the churches were completely destroyed. From there we followed the Aisne to Compeigne, but it was growing dark, and as we passed through the great forest and through Senlis and back to Paris we saw nothing of the landscape.

The contrast between the Marne Valley and the British front, described by Mr. Spilsbury, is quite striking. Along the British front there was a picture of absolute desolation which held out little hope of restoration. The natural beauty of the Marne Valley still remains, and there seems to be an encouragement to rebuild. I have no doubt that the fertile soil of that country and its natural beauty will soon prevail over the wreck of war.

Now, a few words on general impressions: First, let me speak of the social conditions which have been caused by the War. The most con-

spurious of these, perhaps, is the separation of families. The entire Northern war zone is depopulated; the able-bodied men were in the army and all the others have gone elsewhere, most of them to Southern France, where they have been employed in war industries, earning more money than they ever dreamed of before, and living in a more equable climate. The great problem is whether they will want to go back. The homing instinct of the French peasant, noted by Mr. Fuller, is not so strong in the farm laborers or industrial workers, and it is a very serious question whether this district can be populated again.

In talking about the social conditions, we must take into account the change which has come over the women of France. They have been wonderfully brave and loyal, and it was pathetic to us at first to see them doing the hard, rough work of porters at the railway stations, but they looked well and well-nourished, and it does not seem to have disagreed with them.

We went through one exceedingly interesting plant, built up by a French captain of industry, M. Citroen. It is a great munition plant, and the problem now is to convert it to a peace basis. His employees were very largely women, and he has done some social work of an extraordinary character.

The French population is not going to die out if M. Citroen can help it. There is a lying-in hospital as part of his establishment, and the women when they have to go there do not stay very long. When they return to their work he allows them a bonus of 10 francs a month for as many times a day as they go out to nurse their babies. We were told that some women get extra compensation of 50 francs a month for nursing their babies five times a day. M. Citroen said that 140 babies had been born in his plant, and not one had died, although the infant mortality, generally speaking, is more than 30 per cent.

These women were said to earn \$5 a day; they have had a taste of economic independence. Will they be willing to return to the old conditions? That is a problem which confronts not only France but the other countries which have been engaged in the war.

The industrial situation has been outlined, perhaps quite fully, by the other speakers. The Northern war zone of France is wrecked and depopulated. In Southern France new war industries have been developed, and they have to be converted to peace industries. There will scarcely be an immediate revival of the fine art manufactures and the production of luxuries for which France was famous before the war, but they must turn their attention to the essential things that France needs in order to live and to recover its prosperity; and that involves an exceedingly serious problem.

There is, then, an unbalanced industrial country; a part of it almost depopulated, the other part developed with a series of industries

new to France and not now needed; and these must be replaced by others.

As to the extent of the damage to industry, we were furnished some figures, and I have taken only those which were most conservative. Some of the estimates are far higher. The devastated area covered 6 000 sq. miles, and in that district it is estimated that 500 000 buildings were damaged; one-half of which were totally destroyed. It is estimated that 500 000 men of the building trades would be continuously employed for 15 years in restoring these buildings.

Reduced to money, the estimated damages are about as follows:

Buildings destroyed or damaged	\$4 000 000 000
Furniture destroyed or stolen	1 000 000 000
Public works wrecked.....	2 000 000 000
Farm lands damaged.....	800 000 000
Live stock, agricultural implements, and forests.	1 200 000 000
Mines and steel works.....	700 000 000
Miscellaneous industrial machinery and raw material destroyed or stolen.....	4 000 000 000

Total \$13 700 000 000

This does not include Belgium, and we must not forget Belgium. When we think of Belgium we think of Louvain, and Dinant, and Ypres, and we think of Albert—the gallant King who gave that stirring reply to the demand of the Huns that they might be allowed to cross his territory, when he said, "No; Belgium is not a highway; it is a sovereign state". We must not forget Belgium.

Now, is this amount, representing, not the cost of the war to France, but simply the physical damage sustained by her, to be paid by Germany? It should be paid to the last dollar; notwithstanding the whine we hear from the other side of the Rhine. Notwithstanding the somewhat disturbing news, which appeared in to-day's papers, that the body which is to deal with the question of terms for extending the Armistice is to have a more civilian cast, and that the great General, under whose unified command this victory was won, and would have been completely won if he had had another fortnight or three weeks, should not figure quite so prominently. The fruits of his victory must not be thrown away. The bill must be paid, and paid to the uttermost farthing.

THE CHAIRMAN.—Gentlemen, the hour is late, and it is understood that this presentation is informal and preliminary to reports which will be made later. I believe these gentlemen will be glad to answer any question, and the subject matter is now open for discussion. There being no discussion the Chairman declares the meeting adjourned.

Vol. LXXXII of *Transactions* Has Been Mailed

Vol. LXXXII of *Transactions*, the volume for 1918, was forwarded to all the members of the Society during the week ending February 1st, 1919, except to those who had asked to have their publications held, or who were in arrears for dues.

Any member of the Society entitled to this volume, who has not received it, will confer a favor on the Secretary by notifying him of this fact.

**Co-operation of the Government
in the Restoration of Construction Activity**

In the Department of Labor at Washington a new division has been created, known as the Division of Public Works and Construction Development, of the Information and Education Section, its object being to promote the restoration of building and engineering construction throughout the country.

During the war the building industry was subject to severe restrictions, and the creation of this division is an evidence of the purpose of the Government to restore this industry to normal conditions. All governmental restrictions have now been removed.

An investigation is being organized, and communication will be established with architects, contractors, manufacturers of building materials, authorities of States and municipalities, etc., in order to ascertain what buildings are under contemplation, the present stage of the projects, the progress being made, the capital available, the labor supply, and the bearing of present land and rental values on the problem. An effort is to be made to relieve building operations from the embarrassment of strikes and controversies, to encourage the development of existing projects, and to give reasons for undertaking new projects.

It is believed by many that the present high prices of labor and building materials, which have checked building operations, will fall within a short time, and this belief is doubtless the cause of the present inactivity in building. This new division will investigate prices and the causes influencing their fluctuations, and it may be disclosed that these prices will not be reduced as soon as expected, in which case it will be wise to build now, when buildings are needed, and thus secure the benefit of present high rentals.

The President, in his recent address to Congress, stated it to be important "that the development of public works of every sort should be promptly resumed."

The Treasury Department has just issued plans for thirty-seven public buildings in different parts of the country, indicating the purpose of the administration to proceed as rapidly as possible with the

peace programme of building. It is expected that Congress will authorize, at this session, a \$10 000 000 programme of construction for the Public Health Service. It is also expected that River and Harbor projects will be prosecuted diligently. It is hoped that this example set by the Government will be followed by States and municipalities.

Many businesses are now in absolute need of additional space, and their work is being conducted at a disadvantage, the loss in the development of business being far greater than the increase in the present cost of construction. This is particularly true of railroads which are now urgently in need of improvements and extensions. Much might be said, also, in favor of constructing monumental business structures, and of home building. It is believed that the new division, after a complete investigation, will be able to take up the problem of the building of homes.

Public Works Planned for 1919

According to reports made public recently by the War Labor Policies Board at Washington, fifty or more of the larger cities of the country have estimated that they will spend approximately \$122 850 000 for public works and buildings. This information was received in response to inquiries by the Board, which wished to know how much employment could be provided for returning soldiers and war workers. It shows that 12 cities in the eastern district are prepared to spend \$46 543 000; 13 cities in the central district, \$41 248 720; 9 cities in the western district, \$30 521 000; and 6 cities in the southern district, \$4 537 000, with many cities yet to report.

Among the cities and the sums reported were:

Boston	\$8 400 000	Des Moines.....	\$2 200 000
Buffalo	6 000 000	Toledo	2 000 000
Pittsburgh	5 150 000	Akron	2 500 000
Philadelphia	13 000 000	Fort Wayne.....	300 000
Syracuse	2 362 000	Sioux City.....	475 000
Springfield, Mass..	4 015 000	Chicago	11 100 000
Worcester	1 800 000	Detroit	4 500 000
Manchester, N. H..	290 000	Spokane	70 000
Savannah, Ga.....	350 000	Sacramento	1 800 000
Chattanooga	600 000	Seattle	15 100 000
Memphis	600 000	San Francisco.....	3 000 000
Atlanta	2 217 000	Salt Lake City....	1 150 000
Dayton, Ohio.....	730 000	Los Angeles.....	6 258 000
Wichita, Kans.....	750 000	Tacoma	2 455 000
Cleveland	8 100 000	San Diego.....	610 000
Kansas City,	525 000		

Report of Patent Committee to National Research Council

In 1917, on the request of the Commissioner of Patents, a committee was appointed by the National Research Council to investigate the Patent Office and the patent system, with a view to increasing their effectiveness, and to consider what might be done to make the Patent Office more of a national institution and more vitally useful to the industrial life of the country.

The following Patent Committee was appointed: Dr. William F. Durand, Chairman; Drs. Leo H. Baekeland and M. I. Pupin, scientists and inventors; Drs. R. A. Millikan and S. W. Stratton, scientists; Dr. Reid Hunt, physician; and Messrs. Frederick P. Fish, Thomas Ewing, and Edwin J. Prindle, patent lawyers. On Dr. Durand's departure for Europe, Dr. Baekeland was appointed Acting Chairman.

This Committee, having made a careful investigation, has recently reported its recommendations, and proposed a programme consisting of four features which it considers are of fundamental importance. They are:

1.—A Single Court of Appeals, having jurisdiction of appeals in patent cases from all the United States District Courts throughout the country, in place of the nine independent Circuit Courts of Appeals in which appellate jurisdiction is now vested. A Bill to establish this Court has already been introduced.

2.—The Patent Office to be a Separate Institution, and independent of the Department of the Interior, or any other department. A copy of a proposed bill for this purpose has been submitted by the Committee.

3.—An Increase in the Force and in the Salaries of the Patent Office. The Committee advances strong arguments for these changes.

4.—Compensation for Infringement of Patents. This provision would make it possible for a patentee to obtain more equitable treatment than at present in infringement cases.

The Washington Award

The Washington Award, founded in 1915 by John W. Alvord, M. Am. Soc. C. E., and administered by the Western Society of Engineers, is awarded annually in the form of a bronze medal or other work of art to "an Engineer whose work in some special instance, or whose services in general have been noteworthy for their merit in promoting the public good." The Commission of Award consists of nine members of the Western Society of Engineers and two members each from the American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Mining Engineers, and American Institute of Electrical Engineers. The Washington Award for

1918 was made to Herbert Clark Hoover, M. Am. Soc. C. E. The Annual Washington Award Meeting of the Western Society of Engineers is scheduled for the third Monday in February of each year.

John Fritz Medal Awarded to General Goethals

The John Fritz Medal for 1919 has been awarded to Maj.-Gen. George W. Goethals, M. Am. Soc. C. E., the builder of the Panama Canal.

The previous recipients of this medal have been:

John Fritz.....	1902
Lord Kelvin.....	1905
George Westinghouse	1906
Alexander Graham Bell.....	1907
Thomas Alva Edison.....	1908
Charles Talbot Porter.....	1909
Alfred Noble.....	1910
Sir William Henry White.....	1911
Robert Woolston Hunt.....	1912
John Edson Sweet.....	1914
James Douglas.....	1915
Elihu Thomson.....	1916
Henry Marion Howe.....	1917
J. Waldo Smith.....	1918

Letters Relating to Action of the Board of Direction and of the Executive Committee, on Resolutions of Duluth Association, and Addressed to All the Local Associations of Members, by Order of the Board of Direction.

"FEBRUARY 4TH, 1919.

"At a meeting of the Board of Direction held January 13th, 1919, certain resolutions adopted by the Duluth Association of Members with regard to the action of the Executive Committee in selecting six representative Civil Engineers to act as a Delegation in connection with representatives of the other National Societies to take part in a Joint Engineering Congress to be held in Paris in December, 1918, for the purpose of discussing technical matters pertinent to reconstruction work and the development of industry, which invitation was extended by the French Engineers with the approval of the French Ministries of Public Works, of Commerce, and of Armament, were considered.

"The resolutions of the Duluth Association of Members in the first place endorse the action of the Executive Committee in accepting the invitation and sending the Delegation to the above Congress.

"Further, that Association recognizes the peculiar fitness of the Delegation selected, but expresses its opinion that this Delegation, com-

posed of five New York City Engineers and one Boston Engineer, is not geographically representative of the American Society of Civil Engineers, and its belief that the membership outside of New York should have been represented by a larger number of members being selected for this Delegation.

"The Duluth Association further expresses its disapproval of all policies of the American Society of Civil Engineers which do not call for the active participation of the membership outside of New York City.

"Copies of this resolution have been sent to the Executive Committee and the other Associations of Members.

"Several communications have been received from other Associations of Members endorsing the action of the Duluth Association in this matter, and one Association, the Colorado Association of Members, considered the resolutions of the Duluth Association and formally decided that no action be taken until further and more definite information as to why the Delegation was chosen as indicated in the resolutions of the Duluth Association becomes available.

"The Secretary was instructed to draft a letter covering this matter and send a copy of it to each Local Association.

"The Delegation selected consisted of J. F. Case, Chairman, Geo. W. Fuller, Nelson P. Lewis, Geo. W. Tillson, Geo. F. Swain, and A. M. Hunt.

"It might be well to state at first that Mr. Geo. W. Tillson has resided in Illinois for some time, and that Mr. A. M. Hunt, while he has been in the Resident District for some time, especially during the last year or two, being actively engaged in war work with the Naval Consulting Board, was for a number of years a resident of the Pacific Coast, residing in San Francisco, and, of course, as is well known, Prof. Swain is a resident of Boston.

"This is only stated as a question of fact, and, of course, had no real bearing on the reasons governing the selection of these gentlemen. There were several things to be considered in the matter. One was especial fitness for the subjects which the French Engineers indicated would be discussed.

"Second, the securing of properly qualified Engineers whose engagements enabled them to arrange to make the long trip in a very short time.

"Third, the necessity for the securing of necessary passports and of having the Delegation properly accredited to the American Ambassador in Paris.

"The first meeting of the Executive Committee at which this matter was brought up was held November 1st, 1918, six members of the Executive Committee being present, also three other members of the Board. The cable signed by A. Millerand, President, which was addressed to Maj. J. F. Case, was presented. It contained the general information as to the Congress and the desire of the French Engineers to have an American Delegation formed, but the invitation was not in such form that it could be considered as being addressed to the Society. The whole matter was very carefully considered, and while all present were very much in favor of doing anything possible, the general feeling was expressed that the invitation should be somewhat more

formal before final acceptance was made. Some cables were exchanged, and the matter was cleared up on or about the seventh of November. The other three Societies were communicated with and all of the gentlemen who finally accepted were communicated with. One Engineer who had been asked, and who had agreed to go, found it necessary, due to other engagements, to decline subsequently.

"It should be borne in mind that the date of the Congress had not been definitely fixed, but the French Engineers had indicated that about the 14th of December would be satisfactory to them, and in order to meet this date it was necessary that the Delegation should go on a steamer whose date of sailing was December 3d. Application had to be made to the State Department for passports, and, as a matter of fact, the application was refused and considerable delay resulted. One of the Delegates from one of the other Societies, and one of those from this Society, did not get their passports until upon the eve of the final sailing which did not take place until December 5th.

"It is the belief of the members of the Board and of the Executive Committee that these conditions were not understood by the Duluth Association, and other Associations which approved the action taken by the Duluth Association when they were giving the matter consideration. There was no thought in the minds of the Executive Committee except that of fulfilling the obligation accepted by the Society when the invitation was accepted, and if an effort had been made to communicate with various parts of the country to ascertain by action of Local Associations, or otherwise, members who would be more widely separated and would still represent the Society in the special subjects designated by the French Engineers, it is exceedingly probable that a Delegation could not have been gotten together in time.

"All of the Delegates except Major Case, have now returned to this country, and it is hoped that a formal report of their operations will soon be presented to the Society.

"Your respectfully,

"CHAS. WARREN HUNT,

"Secretary."

"JANUARY 31ST, 1919.

"At a meeting of the Board of Direction of the American Society of Civil Engineers, January 13th, 1919, preamble and resolutions adopted by the Duluth Association of Members at a meeting held December 28th, 1918, relating to the Committee on Development in regard to the postponement of its proposed meeting on January 13th to 18th, 1919, these resolutions having been forwarded to all members of the Committee on Development and to all Local Associations of Members, were considered. I am directed by the Board to state briefly the attitude of the Board in the matter, and for the information of the Local Associations of Members.

"While the finances of the Society were temporarily not in very good condition owing to remission of dues on account of war service, lack of income from non-rental of old quarters, etc., as stated in the Annual Report of the Board of Direction which will be published in the January Number of *Proceedings*, this condition did not have

so much to do with the question of the holding of this proposed meeting as certain other matters.

"Quoting from a letter of a member of the Executive Committee of the Development Committee, and who is a Chairman of one of its Sub-committees:

"If it were necessary that the Committee should hold a meeting at the time of the Annual Meeting, its members—such is my impression of them—would not hesitate to take the chance of reimbursement for mileage at such time as the Society would be able to afford it. The point is, that the proposed meeting is really not warranted.

"The Committee's work is now in the sub-committee stage. The sub-committees are entrusted to collect, digest and present intelligibly to the main committee all reasonably available facts and views pertaining to their special assignments, so as to enable the main committee to form and pass correct judgment. Presumably the main committee does not wish to arrive at its conclusions by incomplete or mistaken information. In the case of the sub-committee of which I am chairman, the proper presentation of its special problems will require the arraying in order of facts relating not only to our own society but to other societies of a similar kind. Considerable time and labor are required and yet the work is hardly begun. * * * I have no doubt that other sub-committees are in similar case.

"The next meeting of the Committee will be warranted only when the sub-committees are ready to report. There is no chance whatever that mine will be ready to report at the time of the Annual Meeting. In fact, a decent respect for the resolution authorizing the appointment of the Committee involves the recognition that the discussions to be elicited at the Annual Meeting are expected to form an important part of the data to be considered by the sub-committees before they report.

"This incident is especially interesting to my sub-committee since it has a direct bearing on one of the most important questions to be studied by them.'

"I am quoting this because it seems to me it is a better statement than I can make of the matter, as I am not at all familiar with the work of the Committee on Development.

"I am also directed to quote from a letter dated January 10th from the Secretary of the Committee on Development:

"I have received copy of resolution adopted by the Duluth Society of Members of the American Society of Civil Engineers on December 28th, protesting against the postponement of the meeting of the Development Committee and beg leave to call attention to one omission in the second paragraph of this resolution which was one of the primary motives guiding the Executive Committee of the Committee on Development in postponing the meeting, viz: that the work of the Committee through its sub-committees had not reached a stage from which sufficient benefit would be secured to warrant the relatively large expenditure which would be necessary to defray the expense of the meeting. The Committee feels that it has an obligation to the Society to render value received for expenses incurred and it is conscientiously endeavor-

ing to promote the work of the Committee as rapidly as possible, consistent with this responsibility.

"It is the hope of the Board of Direction that this letter will be presented to the next meeting of each of the Local Associations so that the members may be advised in regard to this matter.

"Yours respectfully

CHAS. WARREN HUNT,

"Secretary."

ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, New Year's Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

March 5th and 19th, 1919.—8.30 P. M.—Meetings will be held as usual on these evenings, that of March 5th being the regular business meeting of the Society. The arrangements for the second meeting are in the hands of the New York Meetings Committee, and programmes for both meetings will be announced later.

ENGINEERING SOCIETIES EMPLOYMENT BUREAU

Under the direction of Engineering Council, the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, have established the Engineering Societies Employment Bureau, under the management of their Secretaries. One of the purposes of the Bureau is to keep in touch with all engineering firms, with a view of supplying them with desirable men.

Plans are now under way to assist in placing men who are retiring from Government Service.

The Bureau is not intended to be exclusively for the benefit of members of the Founder Societies; non-members who are introduced properly will also be registered.

Further information, registration forms, etc., may be obtained from Walter V. Brown, Manager, Engineering Societies Employment Bureau, Room 903, Engineering Societies Building, 29 West 39th Street, New York City.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction to the members who have made use of the resources of the Society in this manner has been expressed frequently, and leaves little doubt that, if it were generally known to engineers that such assistance could be had, many would avail themselves of it.

On October 1st, 1916, the Library of the American Society of Civil Engineers ceased to exist as such, and was merged in the Engineering Societies Library, adding 67 000 volumes to the collection, which comprises also the former libraries of the American Institute of Mining

Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, and now has a total of 140,000 volumes and pamphlets. Containing, as the Library now does, the special collections mentioned, its scope is broadened, and, as it receives an unusually large number of technical periodicals, it is well equipped to continue the service formerly rendered by the Society Library.

The Engineering Societies Library offers this service at a cost which is trifling compared with the value of the time of an engineer who personally looks up such matters, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

It sometimes happens that references are found which are not readily accessible to the person for whom the search is made. In that case the Library is prepared to furnish photographic copies of the material at a small price per page. This method is particularly useful when there are drawings or figures in the text, which would be very expensive to reproduce by hand.

The Library is also able to provide translations of articles in foreign languages when desired.

Requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association, Organized 1905.

E. J. Schneider, President; Nathan A. Bowers, Secretary-Treasurer, 502 Rialto Building, San Francisco, Cal.

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Engineers' Club, 57 Post Street, on the third Tuesday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at noon, every Wednesday, at the Engineers' Club, where special tables are reserved for members and guests of the Association.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association, Organized 1908.

L. R. Hinman, President; A. N. Miller, Secretary-Treasurer, 1400 West Colfax Avenue, Denver, Colo.

The meetings of the Colorado Association of Members of the American Society of Civil Engineers (Denver, Colo.) are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesday at 12.30 P. M., at Daniels and Fisher's.

Visiting members are urged to attend the meetings and luncheons.

(Abstract of Minutes of Meeting)

December 21st, 1918.—The meeting was called to order at the Denver Athletic Club; President L. R. Hinman in the chair; A. N. Miller, Secretary; and present, also 9 members and 1 guest.

The minutes of the meeting of November 16th, 1918, were read and approved.

The resolutions adopted by the Duluth Association, relative to the representation of the American Society of Civil Engineers at the Joint Engineering Congress in Paris, were read by the Secretary. On motion, duly seconded, it was decided that no action be taken on this matter until further and more definite information becomes available as to the manner of choosing the delegation.

The Committee on Legislation reported that the majority of the Committee was opposed to licensing civil engineers in Colorado. A minority report, signed by Messrs. Drager and Field, was also presented.

Mr. Thomas L. Wilkinson reported on the work of the Committee on Development at its Chicago meeting.

Owing to lack of time, Mr. Ridgway's address on "Unit Values for Transportation Service" was postponed.

Adjourned.

Atlanta Association, Organized 1912.

T. P. Branch, President; J. T. Wardlaw, Secretary-Treasurer, 1530 Healey Bldg., Atlanta, Ga.

Informal luncheons are held for members of the Association on the last Monday of each month, at 12.30 P. M. The place is not fixed, but this information will be furnished on application to the Secretary.

(Abstract of Minutes of Meeting)

December 30th, 1918.—The Annual Meeting was called to order in the Chamber of Commerce; President B. M. Hall in the chair; T. P. Branch, Secretary.

A communication from the Duluth Association relative to representation of the Society by members outside of New York City, was presented. On motion duly seconded, it was declared to be the sense of the meeting that the Atlanta Association joins with the Duluth Association in its protest that the membership outside of New York City

has been given practically no representation on the Joint Engineering Congress in Paris.

The following officers for the ensuing year were elected: President, T. P. Branch; Vice-President, V. H. Kriegshaber; Secretary-Treasurer, J. T. Wardlaw.

Plans for next year's activities were discussed.

On motion, duly seconded, it was declared to be the sense of the meeting that laws be enacted to compel the construction of fire-proof schools.

Adjourned.

Baltimore Association, Organized 1914.

H. G. Perring, President; Charles J. Tilden, Secretary-Treasurer, The Johns Hopkins University, Baltimore, Md.

Cleveland Association, Organized 1914.

F. D. Richards, President; George H. Tinker, Secretary-Treasurer, 516 Columbia Building, Cleveland, Ohio.

(Abstract of Minutes of Meeting)

January 4th, 1919.—The meeting was called to order at 12.30 P. M., in the rooms of the Cleveland Engineering Society; President Harry Fuller in the chair; George H. Tinker, Secretary; and present, also, 25 members.

The minutes of the meetings of July 13th and September 17th, 1918, were read and approved.

Messrs. Willard Beahan, James Ritchie, and E. W. Bowen were appointed by the President as a Nominating Committee to select a ticket for officers for 1919.

The report of the Secretary-Treasurer was read and approved.

The President commented briefly on the activities of the Association during the past year.

The Secretary announced the appointment by the President of Mr. E. B. Thomas as the Association's representative on the Committee on Development, and of Messrs. J. R. Poe and J. E. A. Moore as an Advisory Committee.

The Secretary announced that, as the result of a letter-ballot, Mr. F. C. Osborn had been recommended for appointment on the American Engineering Standards Committee.

The Secretary announced that the Pittsburgh Association desired the appointment of Mr. N. S. Sprague on the Nominating Committee to represent District No. 6.

The Secretary presented a communication from the Duluth Association containing resolutions in relation to the appointment by the Executive Committee of representatives of the Society at the Joint Engineering Congress in Paris, and, on motion, duly seconded, the meeting approved the action of the Duluth Association and ordered that that Association and the Executive Committee be so advised.

The Secretary was directed to invite Messrs. Talbot and Khuen to visit Cleveland and address the Association and the Cleveland Engineering Society.

Mr. E. B. Thomas reported on the work of the Committee on Development at its Chicago meeting, and this was followed by a discussion of the relations between the Association and the Cleveland Engineering Society. On motion, duly seconded, it was decided that a committee of three be appointed to confer with a similar committee from the Cleveland Engineering Society on closer relations between the two organizations.

The following officers were elected for 1919: President, F. D. Richards; Vice-President, W. P. Brown; Secretary-Treasurer, George H. Tinker.

Adjourned.

Detroit Association, Organized 1916.

T. A. Leisen, President; Clarence W. Hubbell, Secretary, 2348 Penobscot Building, Detroit, Mich.

The regular meetings of the Association are held on the second Friday of December, April, and October, the last being the Annual Meeting.

District of Columbia Association, Organized 1916.

A. P. Davis, President; John C. Hoyt, Secretary-Treasurer, U. S. Geological Survey, Washington, D. C.

(Abstract of Minutes of Meeting)

December 30th, 1918.—The Annual Meeting was called to order in the parlors of the Cosmos Club; President A. P. Davis in the chair; John C. Hoyt, Secretary; and present, also, 23 members.

The reports for the past year were presented.

The following officers were elected for the ensuing year: Arthur P. Davis, President; David S. Carll, Vice-President; John C. Hoyt, Secretary-Treasurer.

The work of the Society's Committee on Development was discussed by G. R. Putnam, the representative of the Association on that Committee, and others.

Adjourned.

Duluth Association, Organized 1917.

W. B. Patton, President; Walter G. Zimmermann, Secretary, Wolvin Building, Duluth, Minn.

The regular meetings of the Association are held at noon on the third Monday of each month (usually at the Kitchi Gammi Club), with luncheon, followed by a short business session and the reading of papers. Visiting members of the American Society of Civil Engineers can secure from the Secretary definite information relative to the meetings, at which they will be welcomed. The Annual Meeting is held on the third Monday in May.

(Abstract of Minutes of Meetings)

December 16th, 1918.—The meeting was called to order; President W. B. Patton in the chair; Walter G. Zimmermann, Secretary; and present, also, 21 members and 2 guests, Col. Francis A. Pope, U. S. A.,

the new Government Engineer for the Duluth District, and Mr. Morgan, of the American Society of Mechanical Engineers, both of whom addressed the meeting.

Mr. Lyonel Ayres read his memoir on the late Edward Porter Alexander, Jun. Am. Soc. C. E., who died in France.

Mr. Ash, Chairman of the Committee on Records, reported a recommendation that technical papers be limited to four subjects each year, the subjects to be assigned by the Programme Committee, and to be followed by discussions at the two following meetings after reading the paper. The recommendation was adopted.

The following resolutions, introduced by Mr. Hawley, were adopted unanimously:

"Whereas: An invitation has been extended by the French Society of Civil Engineers with the approval of the French Ministries of Public Works, of Commerce, and of Armament, to the American Society of Civil Engineers to send a delegation to a Joint Engineering Congress to be held in Paris in December for the purpose of discussing technical matters pertinent to reconstruction work and development of industry;

"Whereas: The Society has replied, accepting the invitation, and has invited the co-operation of the other National Societies of Mechanical, Electrical, and Mining Engineers;

"Whereas: At a special meeting of the Executive Committee held on November 22d, 1918, at which there were present Messrs. Kittredge, Alvord, Flinn, and C. W. Hunt, and Messrs. Lewis and A. M. Hunt of the Committee on Reconstruction Work, and Mr. Noble of the Committee on Development;

"Whereas: As a result of this meeting five New York City engineers and one Boston engineer have been chosen to represent the American Society of Civil Engineers, at the Joint Engineering Congress in Paris;

"Resolved: That the Duluth Association of Members of the American Society of Civil Engineers endorses the action of the Executive Committee in accepting the invitation and sending a delegation to above Congress;

"Resolved: That while the Duluth Association recognizes the peculiar fitness of the delegation selected, it is of the opinion that this delegation, composed of five New York City engineers and one Boston engineer, is not geographically representative of the American Society of Civil Engineers;

"Resolved: That the Duluth Association expresses its belief that the membership of the American Society outside of New York should have been represented by a larger number of members being selected for this delegation;

"Resolved: That the Duluth Association expresses its disapproval of all policies of the American Society of Civil Engineers which do not call for the active participation of the membership outside of New York City;

"Resolved: That copies of this Resolution be sent to the Executive Committee and the other Associations of Members."

The President introduced the question of the licensing of Engineers, now a current topic, stating that there was a possibility that it would come before the next meeting of the Minnesota Legislature. Mr. Hoyt stated that the matter was now being investigated by the Minnesota Joint Engineering Board, and might well be taken up by the Association, with a view to making recommendations, if it should come before the Legislature. On motion, duly seconded, the President was authorized to appoint a committee of three to make a thorough study of the subject, and to report at the next meeting. The President appointed Messrs. Reed, Clapper, and McCool to serve on this committee.

The President brought up the subject of the Engineering Societies of the country taking action in regard to post-bellum conditions, the employment of labor in the development of the country, and financial conditions with respect to public works. No action was taken.

Mr. Woodbury stated that he had been asked by the Secretary of Engineering Council to act as local Duluth correspondent with Engineering Council, that he had received many communications of interest to the Engineering Profession, and that he would be in favor of holding a special meeting at which this correspondence could be read and discussed. On motion, duly seconded, it was decided to hold a special meeting on Saturday, December 28th, 1918.

Owing to lack of time, the reading of a paper entitled "Hydraulic Lime and Its Uses in Concrete", by Mr. William E. Hawley, was postponed until January, that paper to be the first of the four papers for 1919.

Adjourned.

December 28th, 1918. (Special Meeting.)—The meeting was called to order at 8 p. m. at the Kitchi Gammi Club; President W. B. Patton in the chair; Walter G. Zimmermann, Secretary; and present, also, 15 members.

The Secretary presented letters from the Secretary of the Society in reference to the resolutions adopted at the meeting of December 16th, 1918.

The special meeting was called primarily for the purpose of presenting a number of letters from Secretary Flinn, of Engineering Council, in regard to the organization of engineers throughout the country. These letters were read by Mr. Woodbury and discussed by the meeting. The President appointed Messrs. Hawley and Lawrie as a committee to prepare resolutions covering certain points in a communication from Secretary Flinn, dated December 11th, 1918. This Committee submitted the following resolutions, and they were adopted unanimously:

"Whereas: It is highly desirable and very important to the membership of the four Founder Societies that said members be kept in touch with and advised of the information secured and progress made by Engineering Council in the projects to be presented for the information of said membership, in order that the members may be enabled to give proper consideration to the same, be it here

"Resolved: By the Duluth Association of Members of the American Society of Civil Engineers, that it recommends to Engineering

Council the adoption of some plan of sending a frequent bulletin or news circular to each of the members of the four Founder Societies as a means of transmitting such information, and be it further

"Resolved: By the Duluth Association that it will approve a temporary diversion of the funds of the societies from technical research and publication of the results thereof, if necessary, to finance such a news bulletin or news circular as suggested above, and let it be further

"Resolved: That a copy of the resolutions be sent to Engineering Council."

The following resolutions were adopted unanimously:

"Whereas: The meeting of the Committee on Development, to be convened in New York January 13th to 18th, has been postponed because of the expense entailed and because such meetings are said not to be favored in conjunction with the Annual Meeting of the Society; be it

"Resolved: That the Duluth Association of Members of the American Society of Civil Engineers considers the work to be performed by said Committee on Development to be paramount to any enterprise or undertaking in which the American Society of Civil Engineers is engaged; and be it

"Resolved: That the Board of Direction should 'especially authorize', in accordance with its resolution of May 5th, 1915, the Committee on Development to hold the proposed meeting in New York, January 13th to 18th, 1919, and be allowed mileage therefor; and be it further

"Resolved: That every facility and encouragement should be given the Committee on Development in its work; and be it further

"Resolved: That a copy of these resolutions be sent to the officials of the American Society of Civil Engineers, to all the members of the Committee on Development, and to all the Local Associations of Members of the American Society of Engineers."

The following resolutions were adopted unanimously:

"Resolved: That the Duluth Association of Members of the American Society of Civil Engineers has the highest confidence in its representative on the Committee on Development, Mr. W. H. Hoyt, and commends his efforts to serve his constituents and his progressive attitude on questions of reorganization as expressed in numerous letters and public utterances; and be it

"Resolved: That this Association is heartily in favor of direct responsible representation being made a cardinal principle in the proposed reorganization; and

"Resolved: That these resolutions be placed in the minutes of this Association and a copy be presented to Mr. Hoyt."

The President appointed Messrs. Pickles and Zimmermann as a committee to draw up and forward to the Board of Direction a letter calling attention to the map in the 1918 Year Book, with a request that this map be corrected and brought up to date before publication in the 1919 Year Book, and that the City of Duluth be shown thereon.

On motion, duly seconded, the Secretary was instructed to obtain the consent of other Local Associations to the exchange of copies of all resolutions of general interest which are being addressed to the Parent Society.

Mr. Hoyt reported on a number of points now being studied by the Committee on Development, and these matters were discussed.

Adjourned.

January 27th, 1919.—The meeting was called to order at noon, at the Kitchi Gammi Club; President W. B. Patton in the chair; Walter G. Zimmermann, Secretary; and present, also, 21 members.

The minutes of the meeting of December 28th, 1918, were read and approved.

The Secretary presented a letter from Mr. E. T. Howson, Secretary of the Committee on Development, requesting certain data regarding each of the Local Associations. The Secretary was instructed to furnish the information as promptly as possible.

The Secretary presented a letter from Mr. W. N. Jones, Secretary of the Northwestern Association, in reference to the Annual Convention. It was decided that the Secretary be instructed to express to the Northwestern Association the willingness of the Duluth Association to use its influence to secure the Convention for the "Twin Cities" and Duluth, along the same lines as worked out for the 1917 Convention, which was later postponed on account of the War, and that the same Committees, Messrs. House and Hoyt, on securing the Convention, and Messrs. Stack, Lewis, and Pickles, on local entertainment programme, be requested to serve and carry out the necessary arrangements.

The Secretary presented a letter from the Secretary of Engineering Council, dated January 8th, 1919, pertaining to the resolutions adopted by the Association, covering the matter of informing the Local Associations about the work of Engineering Council.

The Secretary presented a number of letters from Local Associations, approving the resolutions adopted by the Association pertaining to the appointment of five Engineers from New York and one from Boston as a representative delegation to the Paris Engineering Congress.

The Secretary presented several letters from Engineering Council, the Committee on Development, and Local Associations, relative to the postponement of the meeting of the Committee on Development at the time of the Annual Meeting of the Society.

The Committee appointed to prepare a memoir of the late Clarence Coleman, M. Am. Soc. C. E., submitted the memoir, and the Secretary was instructed to file it and forward a copy to the Society for publication.

Mr. Hoyt, who had attended the Annual Meeting of the Society, reported on his observations at that meeting.

Mr. Woodbury reported on his attendance at the meeting of the Illinois Association, and read a letter from the American Society of Mechanical Engineers in reference to the "Pan American Engineering Organization".

Messrs. Coe and Bryan were asked to prepare short talks on their army experience for the next meeting.

Adjourned.

Illinois Association, Organized 1916.

H. J. Burt, President; Edgar S. Nethercut, Secretary-Treasurer, 1735 Monadnock Blk., Chicago, Ill.

The regular meetings of the Association are held on the second Monday of March, June, September, and December, the last being the Annual Meeting. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary.

Louisiana Association, Organized 1914.

Arsène Perrilliat, President; Eugene F. Delery, Secretary, 2007 Lahaarpe Street, New Orleans, La.

The regular meetings of the Association are held at The Cabildo, New Orleans, La., on the first Monday of January, April, July, and October.

Nebraska Association, Organized 1917.

Adna Dobson, President; Homer V. Knouse, Secretary-Treasurer, 109 City Hall, Omaha, Nebr.

Regular meetings of the Association are held on the first Saturday of each month, except July and August, and at such places as may be appointed from time to time by the Executive Committee. The Annual Meeting is held in Lincoln, Nebr., on the second Friday in January.

Visiting members of the Society are especially urged to communicate with the Secretary when in the city.

(Abstract of Minutes of Meeting)

January 4th, 1919.—The Annual Meeting was called to order, at the Lincoln Hotel, Lincoln, Nebr.; President Campen in the chair; Homer V. Knouse, Secretary; and present, also, 17 members and guests.

The minutes of the meeting of December 7th, 1918, were read and approved.

The Secretary presented a number of communications.

Messrs. Grant and Hershey were appointed Tellers to canvass the ballots for officers for 1919, and, on the presentation of their report, the President announced the following elections: President, Adna Dobson; Senior Vice-President, John A. Bruce; Junior Vice-President, A. C. Arend; Secretary-Treasurer, Homer V. Knouse.

Due to illness, President-elect Dobson was not present, and, on his behalf, a message of appreciation and greeting was conveyed to the Association by Mr. Campen.

Vice-President Bruce made a short address, mentioning the lines to which the activities of the Association should be devoted during the coming year, and urging a still greater degree of co-operation on the part of each member.

The Preliminary Report of the Committee on Development was discussed, and the following resolution adopted:

"Resolved, That this Association believes that Courts should be permitted (or required) to appoint one or more engineers to advise

them regarding engineering matters, and that the engineer or engineering commission so appointed may be instructed to act as Masters, or make independent investigations and submit written reports for the information of the Court."

Mr. Grant, Chairman of the Legislative Committee, reported orally on matters which should come before the next session of the Legislature. The Legislative Committee was instructed to prepare, and introduce at the present session of the Nebraska Legislature, an Engineers' License Law, after a study of the bill prepared by the Parent Society and laws in effect or under consideration in other States; also to introduce a bill to increase the annual salary of the State Engineer to \$5 000, and of the Engineer of the State Board of Health to \$3 000.

On motion, duly seconded, the retiring President was instructed to appoint a Legislative Committee, subject to the approval of the President-elect. The following were appointed: Mr. William Grant, Chairman, and Messrs. A. S. Mirick, A. H. Edgren, John A. Bruce, C. Louis Meyer, John L. Hershey, and W. F. Day.

On motion, duly seconded, the retiring President was instructed to appoint a Programme Committee, subject to the approval of the President-elect. The following were appointed: Mr. William Grant, Chairman, and Messrs. R. H. Findley and Karl E. Vogel.

On motion, duly seconded, the Secretary-Treasurer was instructed to levy a special assessment of \$2 per member for the year 1919.

Mr. Clark E. Mickey presented a report advising that the Regents of the State University would probably authorize a short course in Highway Engineering during the coming year, to be followed by a Highway Institute for County Commissioners and others interested.

Adjourned.

Northwestern Association, Organized 1914.

Ralph D. Thomas, President; W. N. Jones, Secretary, City Engineer's Office, City Hall, Minneapolis, Minn.

The meetings of the Association are held bi-monthly, alternating between St. Paul and Minneapolis, on the third Friday of each month. Information as to the time and place of such meetings will be furnished on application to the Secretary.

Philadelphia Association, Organized 1913.

F. Herbert Snow, President; Henry T. Shelley, Secretary, 416 City Hall, Philadelphia, Pa.

The regular meetings of the Association are held at the Engineers' Club of Philadelphia, 1317 Spruce Street, on the first Monday in January, April, and October, the last being the Annual Meeting.

(Abstract of Minutes of Meeting)

January 6th, 1919.—A meeting of the Board of Directors was called to order at 5.30 P. M., at the Union League Club; President Snow in the chair; H. T. Shelley, Secretary; and present, also, Messrs. S. T. Wagner, W. L. Stevenson, and John Meigs.

On motion, duly seconded, Mr. Fred C. Dunlap was elected to fill the vacancy on the Board of Directors, caused by the election of Mr. Shelley as Secretary.

On motion, duly seconded, the Board of Directors authorized the appointment of a Committee on Meetings, such Committee to have not more than five members, one of whom is to be the Secretary of the Association.

On motion, duly seconded, the appointment of a Committee on Membership was authorized, to be composed of not less than five nor more than fifteen members, including the Secretary of the Association.

On motion, duly seconded, the appointment of a Committee on Publications was authorized, this Committee to have not more than five members and to include the Secretary.

On motion, duly seconded, the Board authorized the appointment of a Committee to review papers read before the Association, and to make recommendations as to what portions of such papers should be made the subject of discussion by the Association.

Adjourned.

Pittsburgh Association, Organized 1917.

Robert A. Cummings, President; Nathan Schein, Secretary-Treasurer, 1510 Carson Street, Pittsburgh, Pa.

The Annual Meeting of the Association is held on the first Monday in October. The time and place of other meetings are not fixed, but this information will be furnished on application to the Secretary.

Portland, Ore., Association, Organized 1913.

E. Burslem Thomson, President; C. P. Keyser, Secretary, 318 City Hall, Portland, Ore.

St. Louis Association, Organized 1888 (Constitution Approved by Board, 1914).

J. A. Ockerson, President; C. W. S. Sammelman, Secretary-Treasurer, 300 City Hall, St. Louis, Mo.

The Annual Meeting of the Association, for the election of officers and for the transaction of business, is held on the fourth Monday in November. Two meetings each year, for the presentation and discussion of technical papers, are held in the Auditorium of the Engineers Club of St. Louis and are open to members of the Associated Societies. Other "get-together" meetings are held regularly for dinner or luncheon on the fourth Monday of each month except July, August, and November.

(Abstract of Minutes of Meeting)

November 25th, 1918.—The Annual Meeting was called to order at 7.45 p. m.; President J. A. Ockerson in the chair; Baxter L. Brown acting as Secretary; and present, also, 9 members.

The minutes of the previous meeting were read and approved.

The annual reports of the Secretary and of the Treasurer were read and approved.

The following officers were elected for the ensuing year: President, J. A. Ockerson; Vice-President, J. W. Woermann; Secretary-Treasurer, C. W. S. Sammelmann; Councilors, J. W. Woermann and W. E. Rolfe.

Mr. Baxter L. Brown reported on the work of the Committee on Development at its Chicago meeting.

Professor Charles E. Galt, of Washington University, presented an interesting analysis of Dr. Charles R. Mann's Report on Engineering Education, and the subject was discussed by Messrs. Woermann, Brown, Gifford, and Ockerson.

A vote of thanks was tendered to Mr. C. M. Daily, the outgoing Secretary, for the efficient manner in which he conducted the office, and as an appreciation of his efforts in behalf of the Association.

On motion, duly seconded, the Secretary was instructed to mail a questionnaire to all members of the Association for the purpose of developing local interest in the Society.

On motion, duly seconded, the dues for the ensuing year were fixed at \$2 per member.

Adjourned.

San Diego Association, Organized 1915.

W. C. Earle, President; Ralph Wueste, Secretary-Treasurer, Bonita, Cal.

Seattle Association, Organized 1913.

A. S. Downey, President; Phil A. Franklin, Secretary, 1409 East 65th St., Seattle, Wash.

The regular monthly meetings and luncheons of the Association are held at the Frye Hotel, 3d Avenue and Yesler Way, at 12.15 P. M., on the last Monday of each month. All members, in any grade, of the American Society of Civil Engineers are cordially invited to attend the meetings when in the vicinity.

Southern California Association, Organized 1914.

George G. Anderson, President; Floyd G. Dessery, Secretary, 511 Central Building, Los Angeles, Cal.

The Southern California Association of Members of the American Society of Civil Engineers (Los Angeles, Cal.) holds regular bi-monthly meetings on the second Wednesday of February, April, June, August, October, and December, the last being the Annual Meeting.

Informal luncheons are held at 12.15 P. M., every Thursday, and the place of meeting may be ascertained from the Secretary.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in Los Angeles, and any such member will be gladly welcomed as a guest at any of the meetings or luncheons.

Spokane Association, Organized 1914.

Peter Mogensen, President; Charles E. Davis, Secretary, City Engineer's Office, Spokane, Wash.

The regular meetings of the Association are held on the second Friday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary.

Visiting members are invited to attend the meetings.

Texas Association, Organized 1913.

R. J. Potts, President; J. H. Brillhart, Secretary, Care, Mosher Mfg. Co., Dallas, Tex.

(Abstract of Minutes of Meetings)

December 13th, 1918.—The meeting was called to order at the University Club, Dallas, Tex.; Vice-President R. J. Potts in the chair; J. H. Brillhart, Secretary; and present, also, 21 members.

The minutes of the previous meeting were read.

The report of the Legislative Committee was received.

The report of the Secretary-Treasurer for 1918, showing receipts, \$187.73, and disbursements, \$172.29, and a cash balance of \$15.44, was received.

J. H. Brillhart, the Association's representative on the Committee on Development, reported on the Chicago meeting of that Committee, and the following matters were discussed: Technical Activities and Standards in Engineering Practice, by O. H. Lang; and Internal Relations and Local Associations, including Co-operation of Sub-committees of Local Associations with National Societies, by Messrs. J. C. Nable and C. H. Chamberlin.

The Secretary read a telegram from President R. C. Gowdy, regretting that illness prevented him from attending the meeting, and C. H. Chamberlin was appointed as a committee to reply.

Adjourned.

December 14th, 1918.—The meeting was called to order at 2 p. m. at the University Club.

The following Committee on Resolutions was appointed: J. M. Howe, Chairman, C. H. Chamberlin, and C. M. Davis.

The following subdivisions of the Report of the Committee on Development were discussed:

II.—Internal Relations and Local Associations.

- 1.—Local Associations, by C. M. Davis.
- 3.—Re-arrangement of the Grades of Membership, by R. L. Morrison.
- 4.—Student Engineers, by R. L. Morrison.
- 5.—Young Men of the Profession, by J. C. Nagle.
- 6.—Personal Service Bureau, by C. H. Chamberlin.

III.—External Relations with the Engineering Profession.

- 3.—Amalgamation of Engineering Societies, by Messrs. R. L. Holmes and C. M. Davis.
- 4.—American Engineers in Foreign Service, by Messrs. R. L. Morrison and E. C. Connor.

IV.—Relations to Public Affairs.

- 1.—Professional Status of the Engineer.
 - a.—Definition of the Engineer, by R. J. Potts.
 - b.—Education of the Engineer, by R. J. Potts.
 - c.—Professional Ethics, by C. T. Bartlett.
 - d.—Service of the Engineer to the Nation, the State, and the Community, by J. F. Witt.

- 2.—Legal Status of the Engineer.
 - a.—Licensing, by J. M. Howe.
 - b.—Legislation and Patent Laws, by C. T. Bartlett.
 - c.—Arbitration and Expert Testimony, by Messrs. R. M. Dunham and W. E. Beilharz.
- 3.—Public Status of the Engineer.
 - a.—Publicity, by E. R. Chamblin.
 - b.—Public and Industrial Affairs, by O. H. Lang.
 - c.—Development of Natural Resources, by E. R. Chamblin.
 - d.—Co-ordination of Government Engineering Activities, by Messrs. C. M. Davis and R. M. Dunham.

The Committee on Resolutions reported a set of resolutions to be forwarded to the Committee on Development. On motion, duly seconded, these resolutions were adopted.

The following officers were elected: R. J. Potts, President; Hans Helland, First Vice-President; C. M. Davis, Second Vice-President; J. H. Brillhart, Secretary-Treasurer.

On motion, duly seconded, the action of the Association, taken at Dallas, in reference to the permanent headquarters of the Society, was rescinded, and the matter left in the hands of the Board of Direction.

On motion, duly seconded, the Secretary was instructed to extend a vote of thanks to the *News* and *Journal* and the press for the publicity given to the Association, to the University Club for the use of its rooms, and to the local members for their hospitality.

E. R. Chamblin was appointed a Committee on Necrology, and reported the following resolutions in reference to the late Robert Earle Shipley, Assoc. M. Am. Soc. C. E.:

"Whereas, Our esteemed friend and brother engineer, Robert E. Shipley, has been called from this life, while in the service of his country; and

"Whereas, A great loss has been sustained thereby, by the Engineering Profession and by each individual member of the American Society of Civil Engineers; be it

"Resolved, That the Texas Association of Members of the American Society of Civil Engineers, assembled in Annual Meeting at Dallas, December 14th, 1918, expresses its high regard for his character, professional attainments and accomplishments, and his self-sacrificing spirit of patriotism; and be it further

"Resolved, That these resolutions be spread upon the minutes, and that a copy be sent to his family".

Eleven candidates were elected to membership in the Association.
Adjourned.

Utah Association, Organized 1916.

A. B. Villadsen, President, 304 Dooly Block, Salt Lake City, Utah.

The Annual Meeting of the Association is held on the first Wednesday in April. The time of other meetings is not fixed, but this information will be furnished on application to the President.

**MINUTES OF MEETINGS OF
SPECIAL COMMITTEES
TO REPORT UPON ENGINEERING SUBJECTS**

**Special Committee to Codify Present Practice on the Bearing Value
of Soils for Foundations, etc.**

January 14th, 1919.—The meeting was called to order at Society Headquarters. Present, Robert G. Cummings (Chairman), Allen Hazen, J. C. Meem, and E. G. Haines (Secretary *pro tem.*)

The question of submitting a report for 1919 was discussed, and it was decided to submit a very brief statement of facts as to progress and intentions for the coming year.

The Chairman agreed to prepare a brief summary of the operations and conclusions to date, covering the classification of soils, methods of conducting tests, etc., and to submit it to the other members for approval or discussion.

Mr. Hazen agreed to present a statement of his experience with certain classes of soil resembling clays, and also suggestions as to methods of tests to determine specific gravity, voids, etc., in clays.

Mr. Meem agreed to furnish a statement of certain experiences as to compression of soils as developed in underpinning operations, etc.

The tentative plans for field testing apparatus for determining the bearing value of soils, as presented by Mr. Haines, were discussed and their general features approved.

Adjourned, subject to the call of the Chairman.

**PRIVILEGES OF ENGINEERING SOCIETIES
EXTENDED TO MEMBERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

American Institute of Electrical Engineers, 25 West Thirty-ninth Street, New York City.

American Institute of Mining Engineers, 25 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 25 West Thirty-ninth Street, New York City.

Asociación de Ingenieros y Arquitectos de Mexico, Avenida Juarez, 12, City of Mexico, Mexico.

Assogiacão dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston,
Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.
Civil Engineers' Society of St. Paul, Public Library, St. Paul,
Minn.

Cleveland Engineering Society, Chamber of Commerce Building,
Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Detroit Engineering Society, Detroit Board of Commerce Building,
Detroit, Mich.

Engineering Association of Nashville, Commercial Club Building,
Nashville, Tenn.

Engineering Association of New South Wales, 5 Elizabeth Street,
Sydney, New South Wales, Australia.

Engineering Institute of Canada, 176 Mansfield Street, Montreal,
Que., Canada.

Engineering Societies Club of Hawaii, E. F. Cykler, Secretary,
Honolulu, Hawaii.

Engineers and Architects Association of Southern California,
405 Hosfield Bldg., Los Angeles, Cal.

Engineers and Architects Club of Louisville, 1412 Starks Building,
Louisville, Ky.

Engineers' Club of Baltimore, 6 West Eager Street, Baltimore, Md.

Engineers' Club of Kansas City, Robert S. Beard, Secretary, Third
Floor, City Hall, Kansas City, Mo.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis,
Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia,
Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont.,
Canada.

Engineers' Club of Trenton, Trent Theatre Building, 12 North
Warren Street, Trenton, N. J.

Engineers' Society of Northeastern Pennsylvania, 415 Washington
Avenue, Scranton, Pa.

Engineers' Society of Pennsylvania, 31 South Front Street,
Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 568 Union Arcade
Building, Pittsburgh, Pa.

Florida Engineering Society, J. R. Benton, Secretary, Gainesville,
Fla.

- Institute of Marine Engineers**, The Minories, Tower Hill, London, E., England.
- Institution of Civil Engineers**, Great George Street, Westminster, S. W., London, England.
- Institution of Engineers of the River Plate**, Calle 25 de Mayo 195, Buenos Aires, Argentine Republic.
- Institution of Mechanical Engineers**, 11 Great George Street, London, S. W. 1, England.
- Institution of Naval Architects**, 5 Adelphi Terrace, London, W. C., England.
- Junior Institution of Engineers**, 39 Victoria Street, Westminster, S. W., London, England.
- Koninklijk Instituut van Ingenieurs**, The Hague, The Netherlands.
- Louisiana Engineering Society**, State Museum Building, Chartres and St. Ann Streets, New Orleans, La.
- Memphis Engineers' Club**, Memphis, Tenn.
- Midland Institute of Mining, Civil and Mechanical Engineers**, Sheffield, England.
- Montana Society of Engineers**, Butte, Mont.
- North of England Institute of Mining and Mechanical Engineers**, Newcastle-upon-Tyne, England.
- Oregon Society of Civil Engineers**, Portland, Ore.
- Pacific Northwest Society of Engineers**, 803 Central Building, Seattle, Wash.
- Rochester Engineering Society**, Rochester, N. Y.
- Sociedad Colombiana de Ingenieros**, Bogota, Colombia.
- Sociedad de Ingenieros del Peru**, Lima, Peru.
- Societe des Ingénieurs Civils de France**, 19 rue Blanche, Paris, France.
- Society of Engineers**, 17 Victoria Street, Westminster, S. W., London, England.
- Southwestern Society of Engineers**, C. E. Barglebaugh, Secretary, 703 First National Bank Building, El Paso, Tex.
- Svenska Teknologforeningen**, Brunkebergstorg 18, Stockholm, Sweden.
- Tekniske Forening**, Vestre Boulevard 18-1, Copenhagen, Denmark.
- Vermont Society of Engineers**, George A. Reed, Secretary, Montpelier, Vt.
- Western Society of Engineers**, 1735 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE ENGINEERING SOCIETIES LIBRARY

(From January 1st to January 31st, 1919)

DONATIONS*

The statements made in these notices are taken from the books themselves, and this Society is not responsible for them.

THE THEORY OF ELECTRICITY:

By G. H. Livens. Cambridge, England, The University Press, 1918. 717 pp., 11 x 7 in., cloth. \$8.25. (Gift of G. P. Putnam's Sons.)

Dissatisfaction with the treatment of this subject in standard textbooks, which the author believes to be incomplete, often unconvincing, and sometimes erroneous, leads him to offer this work as a general textbook on the mathematical aspects of modern electrical theory in which an attempt is made to present the complete subject in a consistent form. Although his exposition is essentially a mathematical one, much of the purely analytical mathematics generally associated with the subject has been omitted. Particular attention, however, has been given to the rigorous formulation of underlying physical principles and to their translation into a mathematical theory. The dynamical aspects of the subject have been specially emphasized throughout.

CLASSROOM LECTURE NOTES:

Automotive Starting, Lighting and Ignition. By R. C. Fryer. 2d ed. N. Y., John Wiley and Sons, Inc.; Lond., Chapman and Hall, Ltd., 1918. 210 pp., diag., 8 x 5 in., cloth. \$1.25.

The author provides a general, concise series of notes, including the essential knowledge needed by the student, but requiring enlargement by the instructor. Eighty-eight pages of wiring diagrams are given.

STEAM ENGINES:

Prepared in the Extension Division of the University of Wisconsin, by E. M. Shealy. (Engineering Education Series.) N. Y., McGraw-Hill Book Co., Inc.; Lond., Hill Publishing Co., Ltd., 1919. 290 pp., 173 illus., 9 x 6 in., cloth. \$2.50.

This is the third of a series of three textbooks on steam engineering, prepared for correspondence students in the University of Wisconsin Extension Division. The aim in this volume is to teach the fundamental principles underlying the operation of the steam engine, in as simple and non-mathematical a manner as possible. Particular attention is given to valve gears.

MAKING THE SMALL SHOP PROFITABLE:

By John H. Van Deventer. N. Y., The American Machinist (McGraw-Hill Book Co., Sole Selling Agents), 1918. 113 pp., illus., 12 x 9 in., 1/2 cloth. \$1.75.

This book contains a series of articles on important phases of the activities of small machine shops, proper methods of working, cost-keeping, etc., and also illustrations of many handy devices for facilitating work, particularly in shops with limited equipment. It is a continuation of the author's "Success in the Small Shop." The articles first appeared in the *American Machinist*.

CHILTON TRACTOR INDEX;

Published Semi-Annually by the Chilton Co., Phila., Jan., 1919. 464 pp., 10 x 7 in., paper. \$1.00.

The Tractor Index is a directory of the manufacturers of tractors, tractor parts and accessories, and power farming machinery in the United States. It also in-

* Unless otherwise specified, books in this list have been donated by the publishers.

cludes an illustrated list of American tractors, in which brief specifications for each tractor are given, a table of complete specifications for 198 tractors, and a similar table of specifications for power farm machinery. A collection of articles on tractors and farm machinery completes the work.

THE FUNDAMENTAL EQUATIONS OF DYNAMICS,

And Its Main Co-ordinate Systems Vectorially Treated and Illustrated from Rigid Dynamics. By Frederick Slatte. Berkeley, University of California Press, 1918. 233 pp., 8 x 6 in., cloth. \$2.00.

The author of this volume feels that the extensiveness of the field of dynamics has necessitated such compression in the general surveys of its principles that the usual treatment leans too heavily on mathematics. His desire has been to prepare a supplement to such standard works, which will direct attention to the physical aspects, and to experimental reasoning, by offering a flexible continuation of an elementary stage with unsettled achievement. The book forms Part Two of "Principles of Mechanics."

PRACTICAL OIL GEOLOGY:

The Application of Geology to Oil Field Problems. By Dorsey Hager. 3d ed. N. Y., McGraw-Hill Book Co., Inc.; Lond., Hill Pub. Co., Ltd., 1919. 253 pp., 126 illus., 37 tab., 7 x 5 in., flexible cloth. \$2.50.

The author of this handbook has aimed to provide a clear, concise, and practical work on the occurrence of oil and its geology, based on American practice. The present edition, the third in four years, has been thoroughly revised, enlarged, and reset.

A HANDBOOK OF PHYSICS MEASUREMENTS:

Vol. I, Fundamental Measurements, Properties of Matter, and Optics; Vol. II, Vibratory Motion, Sound, Heat, Electricity and Magnetism. By Ervin S. Ferry, in Collaboration with O. W. Silvey, G. W. Sherman, Jr., and D. C. Duncan. N. Y., John Wiley and Sons, Inc.; Lond., Chapman and Hall, Ltd., 1918. 251 + 233 pp., illus., tab., 8 x 5 in., cloth. \$2 per volume.

The aim of this work is to furnish the student of pure or applied science with a self-contained manual of the theory and manipulation of those measurements in physics which bear most directly on his subsequent work in other departments of study and on his future professional career. The experiments have been selected with regard to the particular determinations now demanded by science and industry and so grouped as to segregate those of value for students of the various branches of engineering.

AMERICAN METHODS IN FOREIGN TRADE:

A Guide to Export Selling Policy. By George C. Vedder. N. Y., McGraw-Hill Book Co., Inc.; Lond., Hill Publishing Co., Ltd., 1919. 204 pp., 8 x 6 in., cloth. \$2.00.

The author of this volume is a believer in the soundness of the distinctively American methods of developing an export trade which hitherto have been adopted by the most efficient world traders. He attempts, in this volume, to explain how these firms have achieved success and to outline the proper policy to be adopted by those interested in entering foreign markets.

THE SILK DIRECTORY:

Davison's Silk Trade; A Directory of the Silk Manufacturers of the United States and Canada, Including Silk Dyers, Finishers, and Printers, Manufacturers' Agents, City Offices and Salesrooms of Silk Mills, Dealers in Raw, Thrown, Spun, and Artificial Silk, Waste, Cotton, Tinsel and Worsted Yarns, Silk Jobbers and Retailers, and a

Classified Directory of All Manufacturers of Silk Goods. 23d annual edition, 1918. N. Y., Davison Publishing Co. (copyright 1918). 778 pp., 8 x 6 in., cloth. \$3.50.

The directory includes dyers, finishers, printers, manufacturers' agents, city offices and salesrooms of mills, dealers, jobbers, retailers, and manufacturers. These are given in lists classified primarily by occupation and secondarily by location. The lists have been carefully revised and enlarged by the addition of new establishments.

AMERICAN HIGHWAY ENGINEERS' HANDBOOK.

Arthur H. Blanchard, Editor-in-Chief. N. Y., John Wiley and Sons, Inc.; Lond., Chapman and Hall, Ltd., 1919. 1658 pp., illus., tab., 7 x 4 in., flexible cloth. \$5.00.

The task undertaken has been the compilation of a reference book which would give reliable and comprehensive information on all branches of highway engineering and related subjects, including organization and administration of highway departments, financing of improvements, highway design, paving, testing, costs, etc. These questions are discussed in twenty-nine sections, each of which has been edited by an authority. Bibliographies for each section and an extensive index have been provided.

CHLORINATION OF WATER.

By Joseph Race. N. Y., John Wiley and Sons, Inc., 1918. 158 pp., 8 x 5 in., cloth. \$1.50.

The author has collected and correlated the scattered information in print on the purification of water by chlorine, and presents a systematic account of the theory, practical application, and results. Numerous references to the original publications are given. Contents: Historical; Modus Operandi; Dosage; Bacteria Surviving Chlorination; Complaints; Bleach Treatment; Liquid Chlorine; Electrolytic Chlorine and Hypochlorites; Chloramine; Results Obtained; Appendix.

**SUMMARY OF SOCIETY MEMBERSHIP SERVING IN THE
ARMIES AND NAVIES OF THE UNITED STATES
AND ITS ALLIES**

February 11th, 1919

AMERICAN ARMY		AMERICAN NAVY	
Major-General	9	Rear-Admirals	5
Brig.-Generals	18	Captains	6
Colonels	52	Commanders	14
Lt.-Colonels	59	Lt.-Commanders	13
Majors	249	Civil Engineers (rank not given)	9
Captains	534	Lieutenants	27
First Lieutenants	252	Lieutenants (Junior Grade)	12
Second Lieutenants	65	Ensigns	10
Regimental Sergeants	1	Asst. Paymaster (rank not given)	1
Master Engineers	8	Chf. Machinist's Mate	2
Master Gunners	2	Chf. Carpenter's Mate	1
Sergeants	16	Total in Navy	100
Corporals	10		
Privates	35		
Students, Training Camps	6		
Miscellaneous	4		
Total	1320		
BRITISH ARMY			
Brig.-Generals	1		
Lt.-Colonels	5		
Majors	10		
Captains	17		
Lieutenants	14		
Second Lieutenants	6		
Corporals	2		
Privates	1		
Miscellaneous	1		
Total	57		
FRENCH ARMY			
Commandant	1		
Captains	1		
Sous-Lieutenant	1		
Aspirant	1		
Miscellaneous	2		
Total	6		
ITALIAN ARMY			
Colonel	1		
Total in Armies	1384		
SUMMARY FOR ARMIES			
Major-Generals	9		
Brig.-Generals	19		
Colonels	53		
Lt.-Colonels	64		
Majors	259		
Commandant	1		
Captains	552		
Lieutenants	266		
Second Lieutenants	72		
Regimental Sergeants	1		
Master Engineers	8		
Master Gunners	2		
Sergeants	16	Total in Armies	1384
Corporals	12	Total in Navy	100
Privates	36		
Students, Training Camps	7	Total on Roll of Honor	1484
Miscellaneous	7	Died in Service	22
Total	1384	Grand Total	1506
RECAPITULATION			

ROLL OF HONOR

A List of Members of the Society Who are Serving in the Army or Navy of the United States or Any of Its Allies.*

VANSITTART, GEORGE EDWARD. Maj., 13th Battery, Canadian Field Artillery, 2d Canadian Div.; wounded in action (France); died May 14th, 1918.

AGNEW, AUGUSTUS WATEROUS. Capt., 3d Canadian Pioneers; wounded in action (France); died September 17th, 1918.

HAGUE, WILLIAM. 1st Lieut., Engr. R. C., 116th Engrs.; died in service (France), January 1st, 1918.

GOODFELLOW, JAMES GORDON. Maj., Royal Engrs.; killed in action (France), March 23d, 1918.

BUCKWALTER, HARRIS DANIEL. Capt., Engr. R. C.; killed in action (France), May 12th, 1918.

LINDBERY, CHARLES ARTHUR. Capt., Engr. R. C.; died in service (Camp Lee, Va.), May 27th, 1918.

ANNEAR, EDGAR HAROLD. Capt., Engr. R. C.; died in service (Hoboken, N. J.), August 28th, 1918.

SLEPPY, KIRBY BALDWIN. Capt., Engineers, U. S. A., 4th Engrs.; killed in action (France), August 4th, 1918.

ALEXANDER, EDWARD PORTER. 1st Lieut., Engineers, U. S. A., 509th Engrs.; died in service (France), September 5th, 1918.

MCCLURE, HUNTER. 1st Lieut., Engineers, U. S. A., Co. N., 21st Engrs.; died in service (France), September 26th, 1918.

REAM, WARD HALL. 1st Lieut., Engineers, U. S. A., Co. C, 305th Engrs.; killed in action (France), October 4th, 1918.

DEDICKE, ERNEST CHARLES. 1st Lieut., U. S. A.; wounded in action (France); died July 15th, 1918.

DEAN, STANLEY. Capt., Quartermaster Corps, U. S. A.; died in service (Camp Humphreys, Va.), October 2d, 1918.

PECK, MYRON HALL. Capt., Engineers, U. S. A., 2d Engrs.; killed in action (France), October 9th, 1918.

HONEYMAN, BRUCE RITCHIE. Capt., Engineers, U. S. A., Co. A, 313th Engrs.; died in service (France), October 15th, 1918.

MILLS, ADELBERT PHILO. Capt., Engineers, U. S. A.; died in service (France), October 20th, 1918.

PRITCHETT, FREDERIC BORRADAILE. Lieut., 109th F. A., Headquarters Co., 28th Div.; wounded in action (France); died September 6th, 1918.

MURRAY, JAMES POWELL. Capt., Engineers, U. S. A.; died in service (Austin, Tex.), September 28th, 1918.

JONES, GRANDVILLE REYNARD. Capt., Sanitary Corps, U. S. A.; died in service (Camp Benning, Ga.), December 22d, 1918.

* This list is made up from replies to a circular forwarded to members of the Society, and others, and is probably neither accurate nor complete. It is requested that the attention of the Secretary be called to any omissions or inaccuracies in order that they may be corrected in subsequent lists.

BELL, VICTOR HUGO. M. S. E., Meteorological Detachment, Signal Corps, U. S. A.; died in service (Arcadia, Cal.), January 6th, 1919.

REILLY, CHARLES GILBERT. Capt., U. S. A., Co. D, 313th Inf.; killed in action (France), October 1st, 1918.

MARIAN, RALPH RICHARDSON. 2d Lieut., U. S. A., Co. B, 105th Engrs.; killed in action (France), October 17th, 1918.

Abbot, Frederic V. Brig.-Gen., Engineers, U. S. A.

Abbot, Frederick William. Lt.-Col., British Army.

Acher, A. H. Maj., Engineers, U. S. A.; Acting Lt.-Col., 4th Engrs., A. E. F., France.

Acker, Robert L. Corporal, Headquarters Co., 7th F. A., A. E. F., France.

Ackerman, Alexander S. Capt., Engineers, U. S. A., A. E. F., France.

Ackerman, Arthur P. 1st Lieut., Engineers, U. S. A., 517th Engrs.

Adams, Arthur. Lt.-Col., Ordnance, U. S. A.

Adams, Edward M. Maj., U. S. A.

Adams, Milton Jewell. Capt., Engineers, U. S. A., Co. C, 114th Engrs.

Adams, Raymond E. Capt., Quartermaster Corps, U. S. A.

Adams, Walter Francis. Sergeant, Co. E, 2d Bn., 23d Engrs., A. E. F., France.

Adams, William H. Capt., Quartermaster Corps, U. S. A.

Albert, Frederick W. Lt.-Col., Engineers, U. S. A., 33d Engrs., A. E. F., France.

Alden, Herbert C. 1st Lieut., Coast Artillery, U. S. A.

Alden, Langford Taylor. Aspirant, 7^e Batterie, 51st Regt. d'Artillerie, Secteur Postal No. 82 (French Army); Care, Morgan, Harjes Cie., Boulevard Haussmann, Paris, France.

Alderman, Ernest S. Lieut., Quartermaster Corps, U. S. A.

Alexander, Kay. Maj., 12th Canadian Ry. Troops, B. E. F., France.

Allen, Franklin R. Capt., Engineers, U. S. A., 603d Engrs., A. E. F., France.

Allen, Herschel Heathcote. Capt., Engineers, U. S. A.

Allen, Ralph B. 1st Lieut., Engineers, U. S. A., Co. B, 25th Engrs., A. E. F., France.

Allen, Raymond C. Capt., Quartermaster Corps, U. S. A.

Allen, Walter Henry. Maj., Engineers, U. S. A.

Allen, Walter Hinds. Commander, Civil Engineer Corps, U. S. N.

Allison, William F. Maj., Engineers, U. S. A., A. E. F., France.

Altman, Frank S. Capt., Engineers, U. S. A., 23d Engrs., A. E. F., France.

Altstaetter, F. W. Col., Engineers, U. S. A.

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- Arakawa, Futoshi.** 2d Lieut., Co. K, 1st Hawaiian Inf., U. S. A., Schofield Barracks, Hawaii.
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- Brown, Earl I. Col., U. S. A., 317th Engrs.

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- Bruton, Philip G. 2d Lieut., A. S. (A. P.), U. S. A.
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- Weidman, William R.** Capt., Engineers, U. S. A., 547th Engrs.
- Welles, Theodore L., Jr.** 1st Lieut., Engineers, U. S. A., 318th Engrs., 6th Div., A. E. F., France.
- Wells, Emery.** 1st Lieut., Engineers, U. S. A., A. P. O. 712, A. E. F., France.
- Welsh, Russell D.** Corporal, Co. F, 115th Engrs., A. E. F., France.
- Wenige, Arthur E.** Maj., Engineers, U. S. A., 317th Engrs.
- Wenzell, Andrew P.** Maj., Engineers, U. S. A., 1st Bn., 16th U. S. Engrs. (Ry.), A. E. F., France.
- West, Edward Hazzard.** Capt., Engineers, U. S. A., 5th Engrs., 7th Div., A. E. F., France.
- West, Wade C.** Capt., Engineers, U. S. A.
- Wheat, G. Neville.** Capt., Engineers, U. S. A.
- Wheeler, Edgar True.** Capt., U. S. A., 125th Engrs.
- Wheeler, Frank I.** 1st Lieut., Air Service (A. P.), U. S. A.
- Wheeler, Robert C.** Capt., Quartermaster Corps, U. S. A.
- Wheelock, De Forest A.** Col., U. S. A.
- Whiteaker, Robert O.** Capt., U. S. A., 132d F. A.

- Whitman, Ezra B.** Maj., Quartermaster Corps, U. S. A.
- Whitman, Ralph.** Lt.-Commander, Civil Engineer Corps, U. S. N.
- Whitney, C. S.** Corporal, Co. F, 25th Engrs., A. P. O. 705, A. E. F., France.
- Whitney, John T.** 2d Lieut., Field Artillery, U. S. A., Co. C, 2d Corps Artillery Park, A. E. F., France.
- Whitney, Ralph Edward.** Capt., Sanitary Corps, U. S. A.
- Whitsit, Lyle A.** Capt., Engineers, U. S. A.
- Whitwell, E.** Capt., General Service Staff, British War Office, Robert Treat Hotel, Newark, N. J.
- Wickersham, John H.** Lt.-Col., Engineers, U. S. A.; Deputy Engr. Supply Officer, General Headquarters, P. O. 706, A. E. F., France.
- Widdicombe, R. A.** Maj., Engineers, U. S. A.
- Wiggin, Thomas H.** Capt., Engineers, U. S. A., Headquarters, Lines of Communications, A. E. F., France.
- Wiggins, Ralph Raymond.** 1st Lieut., Aviation Section, Signal Corps, U. S. A.
- Wilcox, Ernest Hardwick.** Capt., Engineers, U. S. A., 543d Engrs., A. E. F., France.
- Wild, H. J.** Maj., Engineers, U. S. A.
- Willard, George T.** Private, Co. E, 318th Engrs.
- Willard, N. R.** Capt., Engineers, U. S. A.
- Wilcomb, George E.** Capt., Quartermaster Corps, U. S. A.
- Willcox, Henry.** Capt., Quartermaster Corps, U. S. A., Constr. Div.
- Williams, Alan F.** 2d Lieut., Co. B, 18th Engrs. (Ry.), U. S. Army P. O. No. 705, A. E. F., France.
- Williams, George D.** Capt., Engineers, U. S. A., Co. H, 548th Engrs., A. E. F., France.
- Williams, Samuel W.** Maj., Engineers, U. S. A.
- Williamson, Harry.** Capt., Royal Engrs.; O. C. 272d Ry. Constr. Co., R. E., E. E. F., Egypt.
- Williamson, Lee H.** 2d Lieut., Engineers, U. S. A., Co. A, 55th Engrs.
- Williamson, Sydney B.** Lt.-Col., Engineers, U. S. A.
- Williar, Harry D., Jr.** Maj., U. S. A., 1st Engrs., A. E. F., France.
- Willis, Walter John.** Lieut. (EDO).
- Wilson, Edbert C.** Capt., Engineers, U. S. A., A. P. O. 790, A. E. F., France.
- Wilson, Everitt W.** Capt., Engineers, U. S. A., Co. A, 304th Engrs.
- Wilson, Harry P.** Capt., Engineers, U. S. A., 310th Engrs.
- Wilson, Louis A.** Capt., U. S. A., 417th Engrs.
- Wilson, Robert B. M.** Capt., Engineers, U. S. A., 311th Engrs.
- Wilson, William R.** Maj., 23d Field Co., R. E., B. E. F., France.
- Wing, Charles B.** Maj., Engineers, U. S. A., 23d Engrs., A. P. O. 738, A. E. F., France.

- Winn, Walter E.** Lt.-Col., Engineers, U. S. A., 114th Engrs., A. E. F., France.
- Winn, Walter S.** Maj., Engineers, U. S. A.
- Winton, Walter Ferrell.** Lt.-Col., U. S. A.
- Wolff, R. B.** Capt., U. S. A.
- Wondries, Charles H.** 1st Lieut., Engineers, U. S. A., 428th Engrs.
- Wood, B. Russell.** Maj., Engineers, U. S. A., A. P. O. 713, A. E. F., France.
- Wood, Frederic J.** Maj., Engineers, U. S. A.
- Woodard, Wilkie.** Capt., Engineers, U. S. A., Co. H, 35th Engrs., A. P. O. 735, A. E. F., France.
- Woodle, Bermon Tisdale.** Capt., Engineers, U. S. A.
- Woodruff, Charles W.** 1st Lieut., U. S. A., 403d Engrs.
- Woodruff, Glenn B.** 1st Lieut., Engineers, U. S. A.
- Woodward, Edwin C.** Capt., U. S. A., 22d Engrs., A. E. F., France.
- Woolworth, W. H.** Maj., Infantry, U. S. A.
- Wooten, William P.** Col., Engineers, U. S. A., Headquarters, 3d Corps, A. E. F., France.
- Wright, Edward.** Capt., Sanitary Corps, U. S. A.
- Wright, Frederick J.** Corporal, Camp Headquarters Co., Camp Dix, N. J.
- Wright, Jesse B.** Capt., Engineers, U. S. A.
- Wright, John Bertram.** Capt., Engineers, U. S. A.
- Wrightson, William D.** Col., Sanitary Corps, U. S. A.
- Yates, Sheldon S.** Field Artillery Officers' Training Camp, Camp Zachary Taylor, Ky.
- Yeo, W. H. W.** Capt., Engineers, U. S. A.
- Yereance, Alex. W.** 1st Lieut., Co. F, 305th Engrs., A. E. F., France.
- Yost, Howard McC.** Maj., Engineers, U. S. A.
- Young, Charles C.** 1st Lieut., Engineers, U. S. A.
- Young, Frederick C.** Capt., Engineers, U. S. A.; Adjt., 114th Engrs., A. E. F., France.
- Young, George S.** Capt., Engineers, U. S. A., 29th Engrs.; Executive Officer, G-2-C, 2d Army, A. E. F., France.
- Zinn, George A.** Col., Engineers, U. S. A.

MEMBERSHIP

(From January 3d to February 6th, 1919.)

ADDITIONS

MEMBERS	Date of Membership
ANDERSON, CHARLES IRVING. Engr. of Bridges and Bldgs. for the Corporate Co., Ill. Cent. R. R., 135 East 11th Pl., Room 800, Chicago, Ill.....	Jan. 13, 1919
ANDERSON, EDWARD STEWART. Chf. Engr., Bannock Eng. Co., 230 Portneuf Bldg., Pocatello, Idaho.....	Jan. 13, 1919
BECK, EDWARD ADAM. 115 Georgia Ave., Goldsboro, N. C.....	May 6, 1914
BERTHE, LUCIUS TULLIUS. Pres., Berthe Eng. Co., Charleston, Mo.....	Nov. 26, 1918
BEYER, THEODORE ALEXANDER. Vice-Pres., James J. Burke & Co., 706 Kearns Bldg., Salt Lake City, Utah.....	May 6, 1914
COHILL, ANDREW ARNOLD. Chf. Engr., P. McGovern & Co., 50 East 42d St., New York City.....	Jan. 14, 1919
GAGE, RALPH HAWES. Care, Gage Structural Steel Co., 3141 South Hoyne Ave., Chicago, Ill.....	Jan. 13, 1919
HACKENBERG, JAMES OSBERNE. Div. Engr., Maryland Div., P. R. R., Room 202, Pennsylvania R. R. Bldg., Wilmington, Del.....	Jan. 13, 1919
LINDSEY, ALFRED RAYMOND. (Franklin & Co.), 906 Crozer Bldg., Philadelphia, Pa.....	Sept. 3, 1912
LYNCH, ALEXANDER SYDNEY. Chf. Engr., Palmer & Lynch, 228 Park St., West Haven, Conn.....	Jan. 14, 1919
MILLER, ALEXANDER NORMAN. Chf. Hydr. Engr., The Vulcan Iron Works Co., 1122 Detroit St., Denver, Colo.....	Dec. 6, 1910
MOSLEY, EARL LOUIS. Asst. Engr., Valuation Dept., Ill. Cent. R. R., B. and B. Dept., Room 1000, Central Station, Chicago, Ill.....	Jan. 14, 1919
MURRAY, SAMUEL. Chf. Engr., Ore.-Wash. R. R. & Nav. Lines, U. S. Railroad Administration, Portland, Ore.....	Sept. 6, 1910
PISTOR, GEORGE EMIL JOHN. Constr. Engr., Hay Foundry & Iron Works, 15 Madison Sq., North, New York City.....	Nov. 26, 1918
RICH, BARZILLAI ALLEN. With Fay, Spofford & Thordike, 308 Boylston St., Boston, Mass.....	Jan. 13, 1919
RUSSELL, HERBERT LAFAYETTE. Cons. Engr., Moffat Blk., Detroit, Mich.....	Jan. 13, 1919
SMITH, ACHESON. Vice-Pres. and Gen. Mgr., Acheson Graphite Co., P. O. Box 616, Niagara Falls, N. Y..	Jan. 13, 1919

MEMBERS (*Continued*)

		Date of Membership
VEATCH, NATHAN THOMAS, JR.	Cons. Engr. Jun.	Nov. 8, 1909
(Black & Veatch), Interstate Bldg., Kansas City, Mo.	Assoc. M. M.	Oct. 1, 1913 Jan. 14, 1919
WOODWARD, FRANK COY.	Herkimer, N. Y. Assoc. M. M.	June 30, 1911 Jan. 14, 1919

ASSOCIATE MEMBERS

ACKER, LAMAR.	County Engr., Sabine County, Nacogdoches, Tex.	Jun.	Jan. 13, 1919
ALEXANDER, ALBERT MANGUM.	Asst. to Steel Supt., Fred T. Ley & Co., 60 South Conception St., Mobile, Ala.	Jun. Assoc. M.	Sept. 2, 1914 Nov. 26, 1918
ARNOLD, LEROY.	Res. Engr., Sinclair Refining Co., 3721 Metropolitan Ave., Kansas City, Kans.	3721	Jan. 13, 1919
BERDEAU, RAY WILLIAM.	Capt., Engrs., U. S. A.; Bn. Commander 220th Engrs., Washington Barracks, Washington, D. C.	Jun. Assoc. M.	May 31, 1916 Jan. 13, 1919
BOYLE, THOMAS JOSEPH.	Engr. of Roads and Bridges, Luzerne County, 1220 Wyoming Ave., Forty-Fort, Pa.	Jan. 13, 1919	
BUELL, WALTER AUGUSTUS.	Sales Engr., Barber-Greene Co., Aurora, Ill.	Jun. Assoc. M.	Oct. 4, 1910 Jan. 13, 1919
COLLISSON, WILLIAM HENRY, JR.	City Engr., City Hall, Ocean City, N. J.	City Hall	Jan. 13, 1919
DINSMORE, OLIVER RAYMOND.	629 Longstaff St., Missoula, Mont.	629	Jan. 13, 1919
DOUGHERTY, NATHAN WASHINGTON.	Prof. of Civ. Eng., Univ. of Tennessee, Knoxville, Tenn.	Univ. of Tennessee	Jan. 13, 1919
DUNN, EVERETT WESLEY.	Dist. Engr., Iowa State Highway Comm., 3810 Peters Ave., Sioux City, Iowa.	Iowa State Highway Comm.	Jan. 13, 1919
EVERS, ERNEST.	Res. Engr., California Highway Comm., Box 985, Arroyo Grande, Cal.	California Highway Comm.	Jan. 13, 1919
FORD, ARTHUR JENKINS.	Chf. Draftsman, Bureau of Power and Light, 334 South Westlake Ave., Los Angeles, Cal.	Bureau of Power and Light	Jan. 13, 1919
FOX, ROBERT MYRON.	Capt., Engrs., U. S. A., Student Co. 1, E. O. T. S., Camp A. A. Humphreys, Va.; Address 195 West Euclid Ave., Detroit, Mich.	Student Co. 1, E. O. T. S.	Jan. 13, 1919
FRANKLIN, WILLIAM HAWLEY.	4223 Eighth Ave., N. E., Seattle, Wash.	4223 Eighth Ave., N. E.	Feb. 6, 1912 Oct. 8, 1918
GÓMEZ GAULT, JOSÉ ANTONIO.	Box 713, Guayaquil, Ecuador	Guayaquil	Sept. 10, 1918
GOODKIND, MORRIS.	Structural Designer, J. G. White Eng. Corporation, Lewis Pl., Lynbrook, N. Y.	J. G. White Eng. Corporation	Jan. 13, 1919
GRUMM, FRED JUSTUS.	Chf. Deputy County Surv.'s Office, San Diego County, 2898 Spruce St., San Diego, Cal.	Chf. Deputy County Surv.'s Office	Jan. 13, 1919

	ASSOCIATE MEMBERS (<i>Continued</i>)	Date of Membership
HABERLE, EDWARD LOUIS.	Draftsman and Bridge Insp., G. N. Ry., St. Paul (Res., 1310 Emerson Ave., North, Minneapolis), Minn.	Jun. Dec. 3, 1913 Assoc. M. Jan. 13, 1919
HARDING, EDWARD CRITTENDEN, JR.	Progress Engr., U. S. Nitrate Plant No. 4, Ancor, Ohio (Res., 46 Tremont Ave., Fort Thomas, Ky.)	Jun. Sept. 2, 1914 Assoc. M. Jan. 13, 1919
HARRISON, GERARDUS.	Cons. Engr. (Goldmark & Harrison), Larchmont Gardens, Larchmont, N. Y.	Jan. 13, 1919
HELM, FRANK.	Office Engr., A. T. & S. F. Ry., 1234 Clay St., Topeka, Kans.	April 7, 1915 Assoc. M. Jan. 13, 1919
JOHNSON, FRANCIS WHITTIER.	Res. Engr., Raymond Concrete Pile Co., 18 Edmonds St., Somerville, Mass.	Jun. Sept. 12, 1916 Assoc. M. Oct. 8, 1918
JOLLEY, HAROLD DEAN.	Chf. Engr., Concrete Eng. Co., Omaha National Bank Bldg., Omaha, Nebr.	Jan. 13, 1919
JUNG, JOHN FREDERICK.	Designing Engr. and Chf. Draftsman, Am. Concrete Steel Co., 1145 Longfellow Ave., New York City.	Jan. 13, 1919
KUCHAR, FRANK MILES.	Prin. Asst. Engr., The J. G. White Eng. Corporation, U. S. Nitrate No. 2, Muscle Shoals, Ala.	Oct. 3, 1911 Assoc. M. Jan. 13, 1919
LARKIN, EDWARD LEO.	Archt., 461 Eighth Ave., New York City.	Jan. 13, 1919
LAVALLE, PETER FRANCIS.	Supt. of Maintenance, The Valier-Montana Land & Water Co., Valier, Mont.	Jan. 13, 1919
LOGAN, WILLIAM STEVENSON.	2106 Spring Garden St., Philadelphia, Pa.	Nov. 26, 1918
LONG, JAMES BLAIR.	Engr., Whittaker & Diehl, 24 West Freedley St., Norristown, Pa.	Jan. 13, 1919
LONGSHORE, RICHARD LIPKEY.	Asst. Engr., Detroit Div., Wabash Ry., Montpelier, Ohio.	Jan. 13, 1919
MARTIN, GEORGE EARL.	Capt., Engrs., U. S. A., 3d Bn., 23d Engrs., Am. Exp. Forces, France; Address, 1475 South Grant St., LaFayette, Ind.	Jun. Nov. 4, 1914 Assoc. M. Oct. 8, 1918
MAULDIN, EARLE.	With J. E. Sirrine, Superv. Engr., Camp Bragg, Fayetteville, N. C.	Jan. 13, 1919
MURRAY, JOSEPH AUGUSTINE, JR.	Lieut. (Junior Grade), C. E. C., U. S. N. R. F., Public Works Office, Navy Yard, Philadelphia, Pa.	Jan. 13, 1919
PAGE, JOHN MARSHALL.	1st Lieut., Ord., U. S. A., Aberdeen Proving Ground, Aberdeen, Md.	Jan. 13, 1919

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership
PHILLIPS, HARRY JOHN. Dist. Engr., The Austin Co., 217 Broadway, New York City.....	Jan. 13, 1919
RIMBAULT, EMILE LEONARD. Mgr. of Eng. Dept. and Chf. of Structural and Mech. Dept., Edward F. Terry Mfg. Co., Grand Central Terminal (Res., 39 Seaman Ave.), New York City.....	Jun. April 1, 1914 Assoc. M. Jan. 13, 1919
ROBERTS, GEORGE BRADEN. 1325 Lee St., Charleston, W. Va. SINGSTAD, OLE. With Chile Exploration Co., 2262 Eighty-third St., Brooklyn, N. Y.....	Nov. 26, 1918 Jan. 13, 1919
STEINBERG, MAX. Junior Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Washington, D. C.....	Jun. Sept. 12, 1916 Assoc. M. Jan. 13, 1919
TERRELL, DANIEL VOIERS. Prof. of Civ. Eng., Univ. of Kentucky, Lexington, Ky.....	Jan. 13, 1919
TRACK, FRANK ANTON. Superv. Insp. of Hull and Machinery, U. S. Shipping Board, Emergency Fleet Corporation; Res., 143 Hancock St., Brooklyn, N. Y.....	Sept. 10, 1918
TRASK, CLARENCE HENRY. Res. Engr., Du Pont Eng. Co., Penniman, Va.....	Jan. 13, 1919
TRINKAUS, WILLIAM HENRY. Asst. Engr., San. Dist. of Chicago, 708 North May St., Chicago, Ill.....	Jan. 13, 1919
VAN TRUMP, SAMUEL NEWBOLD. Chf. Engr., Water Dept., Wilmington, Del.....	Jan. 13, 1919
VAUGHN, ROMNEY LEIGH. Gen. Supt., Standard Am. Dredging Co., 414 Thirteenth St., Oakland, Cal.....	Jun. Sept. 3, 1912 Assoc. M. Sept. 10, 1918
WALKER, ROBERT YULE. Contr. (Taylor & Walker), 601 Majestic Bldg., Oklahoma, Okla.....	Jun. May 6, 1914 Assoc. M. Jan. 13, 1919
WATSON, MARTIN WALLACE. Acting State Highway Engr., Kansas Highway Comm., Topeka, Kans.....	Jan. 13, 1919
WESTENHOFF, ALPHONSE MUELLER. Designer, Chf. Engr.'s Office, C., C., C. & St. L. Ry., 1614 Westmoreland Ave., Cincinnati, Ohio.....	Jun. Mar. 2, 1915 Assoc. M. Jan. 13, 1919
WILLIAMS, GUY MORRIS. Associate Engr., Bureau of Standards, Dept. of Commerce, Washington, D. C....	Jan. 13, 1919
WILSON, HENRY HARRISON. Res. Managing Partner, Winston & Co., Pennsboro, W. Va.....	Nov. 26, 1918

JUNIORS

BOMAR, JOHN EARLE. Levelman, Braden Copper Co., Ran-	
cagua, Chile.....	Oct. 8, 1918
DOWD, MUNSON JULIUS. 624 Juniper Ave., Long Beach, Cal.	Jan. 13, 1919

JUNIORS (Continued)

	Date of Membership
GERIG, FRANCIS AUSTIN. Dumas, Ark.....	Sept. 10, 1918
GLESSNER, MAURICE DAVID. Lieut., Engrs., U. S. A., Co. 1, Sec. A., E. O. T. S., Camp A. A. Humphreys, Va.....	Jan. 13, 1919
KWAN, TSU-CHANG. Drafting Dept., Tientsin-Pukow R. R. Office, Tientsin, China.....	Oct. 8, 1918
MARTIN, LLOYD LITTELL. 703 North 2d St., Harrisburg, Pa.	Oct. 8, 1918
O'BRIEN, JAMES BRUCE. Central Hershey, Habana, Cuba....	Sept. 10, 1918
TILLOTSON, ELBERT SAUNDERS. 124 East 19th St., Brooklyn, N. Y.	Nov. 26, 1918

REINSTATEMENTS**ASSOCIATE MEMBERS**

	Date of Reinstatement
COLEMAN, HENRY FITCH.....	Jan. 13, 1919

RESIGNATIONS**MEMBERS**

	Date of Resignation
FITZGERALD, JOHN LELAND.....	Dec. 31, 1918
MERYWEATHER, HENRY FRANCIS.....	Dec. 31, 1918
WATSON, WILLIAM CRAVEN.....	Dec. 31, 1918

ASSOCIATE MEMBERS

POTTER, JAMES ROWLAND.....	Dec. 31, 1918
KEANEY, CHARLES FRANKLIN.....	Dec. 31, 1918
WATSON, WALTER.....	Dec. 31, 1918
ZORN, GEORGE WASHINGTON.....	Dec. 31, 1918

JUNIORS

MORGAN, WILLIAM RICHARD.....	Dec. 31, 1918
WHELAN, CHARLES MALLORY.....	Dec. 31, 1918

DEATHS

BELL, VICTOR HUGO. Elected Junior, March 14th, 1916; died in service January 6th, 1919.	
BERGER, BERNT. Elected Associate Member, April 5th, 1893; died January 15th, 1919.	
BROOKS, FREDERICK. Elected Junior, June 7th, 1876; Member, January 2d, 1884; died January 10th, 1919.	
CARPENTER, ROLLA CLINTON. Elected Member, April 4th, 1911; died Janu- ary 19th, 1919.	
DUBOIS, GUSTAVO ADOLFO. Elected Junior, September 1st, 1908; Associate Member, May 6th, 1914; died August 30th, 1918.	
GIBBS, WILLIAM WETMORE. Elected Junior, October 7th, 1914; Associate Member, May 15th, 1917; died January 13th, 1919.	
HAVEN, WILLIAM APPLETON. Elected Member, March 5th, 1873; died Janu- ary 6th, 1919.	

- HORTON, JOHN WILLIAM. Elected Junior, September 1st, 1908; Associate Member, December 2d, 1914; died December 24th, 1918.
- JONES, GRANDVILLE REYNARD. Elected Junior, January 7th, 1908; Associate Member, May 2d, 1911; died December 22d, 1918.
- KINGSLEY, MARVIN WATSON. Elected Member, July 3d, 1878; date of death unknown.
- MARRIOTT, RALPH RICHARDSON. Elected Junior, April 18th, 1916; killed in action (France), October 17th, 1918.
- REILLY, CHARLES GILBERT. Elected Junior, May 7th, 1913; killed in action (France), October 1st, 1918.
- STANTON, FRED CASWELL. Elected Associate Member, April 1st, 1908; Member, December 31st, 1913; died January 24th, 1919.
- STONE, HENRY MORTON. Elected Member, April 3d, 1907; died December 8th, 1918.

Total Membership of the Society, February 6th, 1919.

8961.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(January 1st, to February 1st, 1919).

NOTE.—This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

- (2) *Journal, Engrs. Club of Phila.*, Philadelphia, Pa.
- (3) *Journal, Franklin Inst.*, Philadelphia, Pa., 50c.
- (4) *Journal, Western Soc. of Engrs.*, Chicago, Ill., 50c.
- (5) *Journal, Eng. Inst. of Canada, Montreal, Que., Canada*.
- (6) *Journal, Am. Inst. of Archts.*, Washington, D. C., 50c.
- (8) *Stevens Indicator*, Hoboken, N. J., 50c.
- (9) *Industrial Management*, New York City, 25c.
- (11) *Engineering (London)*, W. H. Willey, 432 Fourth Ave., New York City, 25c.
- (12) *The Engineer (London)*, International News Co., New York City, 35c.
- (13) *Engineering News-Record*, New York City, 15c.
- (15) *Railway Age*, New York City, 15c.
- (16) *Engineering and Mining Journal*, New York City, 15c.
- (17) *Electric Railway Journal*, New York City, 10c.
- (18) *Railway Review*, Chicago, Ill., 15c.
- (19) *Scientific American Supplement*, New York City, 10c.
- (20) *Iron Age*, New York City, 20c.
- (21) *Railway Engineer*, London, England, 1s. 2d.
- (22) *Iron and Coal Trades Review*, London, England, 6d.
- (24) *American Gas Engineering Journal*, New York City, 10c.
- (25) *Railway Mechanical Engineer*, New York City, 20c.
- (26) *Electrical Review*, London, England, 4d.
- (27) *Electrical World*, New York City, 10c.
- (28) *Journal, New England Water-Works Assoc.*, Boston, Mass., \$1.
- (29) *Journal, Royal Society of Arts*, London, England, 6d.
- (32) *Mémoires et Compte Rendu des Travaux, Soc. Ing. Civ. de France*, Paris, France.
- (33) *Le Génie Civil*, Paris, France, 1 fr.
- (36) *Cornell Civil Engineer*, Ithaca, N. Y.
- (42) *Proceedings, Am. Inst. Elec. Engrs.*, New York City, \$1.
- (43) *Annales des Ponts et Chaussées*, Paris, France.
- (45) *Coal Age*, New York City, 10c.
- (46) *Scientific American*, New York City, 15c.
- (47) *Mechanical Engineer*, Manchester, England, 3d.
- (54) *Transactions, Am. Soc. C. E.*, New York City, \$12.
- (55) *Mechanical Engineering Journal*, Am. Soc. M. E., New York City, \$10.
- (56) *Transactions, Am. Inst. Min. Engrs.*, New York City, \$6.
- (57) *Colliery Guardian*, London, England, 5d.
- (58) *Proceedings, Engrs.' Soc. W. Pa.*, 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
- (59) *Proceedings, American Water-Works Assoc.*, Troy, N. Y.
- (60) *Municipal and County Engineering*, Indianapolis, Ind., 25c.
- (61) *Proceedings, Western Railway Club*, 225 Dearborn St., Chicago, Ill., 25c.
- (62) *American Drop Forger*, Thaw Bldg., Pittsburgh, Pa., 10c.
- (63) *Minutes of Proceedings, Inst. C. E.*, London, England.
- (64) *Power*, New York City, 5c.
- (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
- (66) *Gas Journal*, London, England, 6d.
- (67) *Cement and Engineering News*, Chicago, Ill., 25c.
- (71) *Journal, Iron and Steel Inst.*, London, England.
- (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
- (72) *American Machinist*, New York City, 15c.
- (73) *Electrician*, London, England, 18c.
- (74) *Transactions, Inst. of Min. and Metal.*, London, England.
- (75) *Proceedings, Inst. of Mech. Engrs.*, London, England.
- (77) *Journal, Inst. Elec. Engrs.*, London, England, 5s.
- (83) *Gas Age*, New York City, 15c.
- (85) *Proceedings, Am. Ry. Eng. Assoc.*, Chicago, Ill.
- (86) *Engineering and Contracting*, Chicago, Ill., 10c.
- (87) *Railway Maintenance Engineer*, Chicago, Ill., 10c.
- (89) *Proceedings, Am. Soc. for Testing Materials*, Philadelphia, Pa., \$5.

- (90) *Transactions, Inst. of Naval Archts.*, London, England.
 (91) *Transactions, Soc. Naval Archts. and Marine Engrs.*, New York City.
 (92) *Bulletin, Soc. d'Encouragement pour l'Industrie Nationale*, Paris, France.
 (93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
 (96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
 (98) *Journal, Engrs., Soc. Pa.*, Harrisburg, Pa., 30c.
 (99) *Proceedings, Am. Soc. of Municipal Improvements*, New York City, \$2.
 (100) *Professional Memoirs, Corps of Engrs., U. S. A.*, Washington, D. C., 50c.
 (101) *Metal Worker*, New York City, 10c.
 (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
 (104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
 (105) *Chemical and Metallurgical Engineering*, New York City, 25c.
 (106) *Transactions, Inst. of Min. Engrs.*, London, England, 6s.
 (107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
 (109) *Journal, Boston Soc. C. E.*, Boston, Mass., 50c.
 (110) *Journal, Am. Concrete Inst.*, Philadelphia, Pa., 50c.
 (111) *Journal of Electricity*, San Francisco, Cal., 25c.
 (113) *Proceedings, Am. Wood Preservers' Assoc.*, Baltimore, Md.
 (114) *Journal, Institution of Municipal and County Engineers*, London, England, 1s. 6d.
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